

# YOUGHIOGHENY RIVER LAKE WATER MANAGEMENT AND REALLOCATION STUDY

## Final Environmental Assessment

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Prepared By:  
The U.S. Army Corps of Engineers, Pittsburgh District  
Pittsburgh, PA

**Abstract:** The Pittsburgh District is proposing to reallocate 10,000 acre-feet of storage within the Youghiogheny River Lake from water quality to water supply and to revise the release schedule. Water quality improvements downstream of the Youghiogheny River Lake have diminished the need for water quality releases and allowed the proposed changes with no significant negative impacts to the downstream water quality. This reallocation of storage and change to the release schedule will allow the District to enter into water supply agreements with interested water purveyors up to the amount of storage reallocated for water supply. The Proposed Action will not impede the flood storage capability and function of the Youghiogheny River Lake. This Environmental Assessment identifies the baseline environmental conditions and provides an analysis of potential impacts from the proposed release schedule changes and reallocation of storage. There are no significant environmental impacts associated with implementing the proposed action.

For more information contact:  
Commander, U.S. Army Corps of Engineers  
Attn: Mr. Curtis N. Meeder, Chief, Planning Branch, Pittsburgh District  
Wm. S. Moorhead Federal Building  
1000 Liberty Avenue, Pittsburgh, PA 15222  
Phone: (412) 395-7228; FAX: (412) 644-6763

## **EXECUTIVE SUMMARY**

The Municipal Authority of Westmoreland County (MAWC) (hereafter referred to as the Sponsor) asked the Army Corps of Engineers to determine if a portion of Youghiogheny River Lake storage could be reallocated from water quality to water supply to help the Sponsor meet an increased demand for water.

In reviewing the Sponsor's request, the Corps re-examined the current release schedule in light of the improved water quality and other project purposes for the Youghiogheny River Lake. The Corps concluded that the original, authorized storage and release schedule, which focused only on flood control and low flow augmentation for water quality, might now be modified to better serve the other project users.

The Proposed Action is described in two steps:

- i. The Corps will reallocate 10,000 acre-feet (4.13% of usable storage) of Youghiogheny River Lake storage from water quality storage to water supply storage, and
- ii. The Corps will modify the water release schedule to meet the request for water supply and to better enhance lake recreation by slowing the rate of drawdown through the summer and early fall recreation season. This proposed change will conserve water early in the year, and will allow the discharge of additional water downstream during the summer and early fall when the increased flow will be needed. The proposed change to the release schedule will not adversely affect the flood control capabilities of Youghiogheny River Lake.

The changes to the release schedule would allow the Sponsor to withdraw the additional water it needs to meet demand without reducing flows in Connellsville below the limits stipulated by the Pennsylvania Department of Environmental Protection.

The water will be withdrawn from the Youghiogheny River by the Sponsor's existing water intakes and processed through an existing facility in South Connellsville. There will be no structural changes to the Youghiogheny Dam or the Sponsor's water intake/treatment facilities as a part of the Proposed Action. There will be no excavation or ground-disturbing activities associated with any part of the Proposed Action.

Three alternatives were examined as follows:

**1. Alternative A** – This alternative would be exactly the same as the Proposed Action with the exception that the release schedule would only be changed to meet the current water supply request. There would be no changes made to the release schedule to enhance in-lake recreation. This is "Alternative 5" of the various storage-release schedules evaluated during the Feasibility Study.

**2. Alternative B** -- The Sponsor would meet their water supply needs by constructing a new impoundment near the mouth of Indian Creek.

**3. No Action** -- The most likely future condition without modification of the Youghiogheny River Lake Project purposes, storage allocation, or water release schedule.

This EA concludes through detailed analyses that the proposed action will not adversely impact: infrastructure; transportation; meteorology and climatologic factors; demographics; land use; air quality; environmental justice; hazardous, toxic, and radioactive waste; and cultural/historic resources. Moreover, the EA demonstrates that the proposed action will not significantly impact water quantity in the lake (pool elevation) and in the river (flow), water quality (dissolved oxygen levels and water temperature) in the lake and river, aquatic and terrestrial ecology, recreation, or aesthetics.

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# **1 INTRODUCTION**

## **1.1 Project Location and Background**

The Youghiogheny River is a perennial stream that originates in the mountainous region of northeastern West Virginia and western Maryland and flows in a generally northerly direction paralleling the West Virginia - Maryland border for a distance of about 39 miles (See Figure 1). It then empties into the Youghiogheny River Lake. The Youghiogheny River Dam is located about 1.3 miles upstream of the town of Confluence, PA, where the Youghiogheny River is joined by the Casselman River. Downstream of the confluence, the Youghiogheny River flows in a northwesterly direction as it meanders 73 miles through several communities to its confluence with the Monongahela River in the City of McKeesport, PA. The main channel of the Youghiogheny River upstream of the lake is incised in a gorge-like valley at an average depth of 450 feet with an average stream slope of 21 feet per mile. The tributaries are much steeper with average slopes from two to seven times that of the upstream main channel. The basin configuration is roughly elliptical, approximately 39 miles from north to south and 14 miles from east to west. The upper portion of the basin lies in the Allegheny Mountain section of the Appalachian Plateau, which is bordered on the west by Laurel Hill and on the east by Negro Mountain. Basin elevations range from 720 feet above the National Geodetic Vertical Datum (NGVD) at the mouth of the river to 3,360 feet NGVD at the southern tip of the basin.

The total drainage area of the Youghiogheny River is 1,763 square miles, of which 434 square miles are contributory to the Youghiogheny River Lake. Approximately 72.3% of the total drainage basin lies in Pennsylvania, 23.6% in Maryland, and 4.1% in West Virginia (ATS, 2000).

The Youghiogheny River Lake project was authorized by the Flood Control Act of 1938 for the purposes of flood stage reduction, low flow augmentation and water quality control in the Youghiogheny and lower Monongahela Rivers. Dam construction was initiated in July 1940, and became operational in January 1948. The Flood Control Act of 1944 provided initial authorization for recreation as an additional project purpose at Corps of Engineers water resource development projects (including Youghiogheny River Lake). Fish and wildlife conservation was authorized as a project purpose by the Fish and Wildlife Coordination Act of 1958, and recreation (including downstream whitewater recreation) was authorized in accordance with the 1988 Water Resources Development Act (WRDA). The generation of hydroelectric power was also added as a project purpose with the installation of hydroelectric facilities in 1989.

## **1.2 Purpose and Need for Corps Action**

The Corps was asked by THE SPONSOR to consider re-allocating a portion of Youghiogheny River Lake storage from water quality to water supply to help them find an alternative source to meet their increased need for water supply.

The Corps is taking this opportunity to re-examine the release schedule in light of the improved water quality and other project purposes for the Youghiogheny River Lake. The original,

authorized storage and release schedule, which focused only on flood control and low flow augmentation for water quality, may now be modified to better serve the other project purposes.

During the last two decades, a dramatic shift in the commercial-industrial mix of the region has taken place. Having lost a significant portion of the heavy industry that once dominated the employment base, the economy has shifted to a primarily recreational-tourism economy that relies heavily on activities associated with the Youghiogheny River Lake and the river itself. This loss of heavy industry, as well as a reduction in the severity of acid mine pollution from tributary streams, has reduced the pollution load of the Youghiogheny River. Consequently, the originally authorized Youghiogheny River Lake storage and release schedule—as it pertains to water quality control—is no longer necessary, since less storage is needed to be dedicated for water quality releases. These improved conditions provided an opportunity for the Corps to re-examine the storage allocation and release schedule.

### 1.3 Project Sponsor and Events Leading to the Present Proposal

Two large community public water systems serve this area of southwest Pennsylvania. These systems, the Sponsor's and North Fayette County Municipal Authority, currently depend on withdrawals from the river in South Connellsville, PA, downstream of the Youghiogheny Dam. The Sponsor serves more than 109,000 customers over a service area of 672 square miles and expects their water demand to continue to increase in the foreseeable future (MAWC, 1999).

The Sponsor's service area contains four urbanized communities (Uniontown, Connellsville, Greensburg, and McKeesport) with a total urban population of approximately 63,000 (USACE, 1993). Also included are a number of industrial facilities and numerous commercial and public recreational boating facilities. Both the Sponsor and North Fayette County Municipal Authority are experiencing a 3-4 % increase annually in customer consumption (USACE, 1993). One significant reason is that water service is expanding into formerly self-supplied rural communities. These water purveyors operate under water allocation permits issued in 1979 by the Pennsylvania Department of Environmental Resources (PADEP). See Table 1.

**Table 1. Water Purveyor Withdrawal Limits from the Youghiogheny River**

Purveyor	Location	PADEP Allocation (Million gallons/day)
Sponsor	McKeesport, PA	10
Sponsor	South Connellsville, PA	23
North Fayette County	South Connellsville, PA	11.7

Source: Youghiogheny River Lake Water Management and Reallocation Study, Feb. 1997.

The current proposal had its origins when, in 1983, PADEP granted the Sponsor a revision to their 1979 Water Allocation Permit (WA: 65:1). That revision required the Sponsor to notify PADEP when withdrawals from the Youghiogheny River exceeded 23 million gallons per day on average over any 30-day period, and to notify the Department of its plans to obtain the amount of water needed over their state-permitted allotment from the Youghiogheny River Lake



or other source (USACE, 1997). Releases from the Youghiogheny River Lake were considered the most reasonable source to augment the current flow and maintain a minimum flow in the river. As stipulated in the permit, PADEP considers the minimum flow of 460 cfs (at Connellsville) necessary to maintain high water quality. This value is modeled as the combination of the controlled (i.e., released from the Youghiogheny River Lake) and uncontrolled (natural unimpeded flow from all other tributaries) flow during a one in 10-year, seven-day, low flow ( $Q_{7-10}$ ).

The Sponsor exceeded the PADEP withdrawal-reporting threshold for the first time in August 1991, during a prolonged drought period. The Sponsor retained the services of an engineering firm to investigate alternatives to obtain supplemental water for use as make-up water during those critical periods when they are in violation of their permit. The most cost effective alternative identified by the study was to purchase or acquire the use of water from the Corps of Engineers' Youghiogheny River Lake Project.

In November 1993, the Corps of Engineers published an Initial Assessment (USACE, 1993) to examine the opportunity for reallocating storage in the Youghiogheny River Lake because of the improving water quality in the basin. The Initial Assessment concluded, "in view of considerable costs and negative impacts associated with alternative water supply strategies, storage reallocation appears to be the most feasible and cost effective means to alleviate future public water supply shortages or dramatic rate increases." The Sponsor expressed a desire to, and became, a cost-sharing partner for the future phases of the study. Although given the opportunity to participate, North Fayette County Municipal Authority declined to be a cost-sharing partner, citing an insufficient need for the additional water based on their projected future demand.

In conjunction with the Sponsor, the Pittsburgh District prepared a reconnaissance study in 1996 which concluded that it would be in the Federal interest to re-examine project operations and consider alterations that would better serve the current mix of users.

Nearly 30 years ago the Corps and Pennsylvania's Department of Environmental Resources (PADER) examined the issue of water supply potential from Youghiogheny River Lake. However, the storage was never re-allocated and the release schedule never changed. Under the authority of Section 22 of the Water Resources Development Act of 1974 (as amended), PADER requested that the Pittsburgh District of the Corps of Engineers undertake hydrologic studies to determine the water supply potential of the Youghiogheny River Lake (PADER, 1977). PADER was concerned with consumptive use makeup requirements to protect the river during low flow periods and believed that existing Corps reservoirs should be evaluated to determine their water supply potential.

That investigation culminated in a Corps document entitled, "Water Supply Potential of Youghiogheny River Lake" published in August 1981. This report examined the capability of the Youghiogheny River Lake to provide water supply through either: 1) the reauthorization of storage, or 2) by modifying the structure to add additional storage for water use. Because of the many pool restrictions and relatively high cost of structural modifications, the study emphasis was placed on reallocation and operating rules revisions (USACE, 1981). The study concluded

that the value and benefits of the project may be enhanced by revising the operation of the lake, particularly changes to the storage and release schedule (USACE, 1993).

## **1.4 Prior NEPA Documentation**

The construction of the Youghiogheny Dam and River Lake preceded the enactment of the National Environmental Policy Act (NEPA) that requires Federal agencies to evaluate the potential environmental effects of their Proposed Actions and carry out decision-making in a public forum. As such, there are no prior Corps of Engineers NEPA documents for the project.

## **1.5 Public Participation**

Throughout the development of this Proposed Action, the Corps of Engineers has coordinated with local officials, resource agencies, and interested citizens. This Environmental Assessment has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) NEPA-implementing regulations (40 CFR 1500-1508), and the Army Corps of Engineers Engineering Regulation No. 200-2-2, "Procedures for Implementing NEPA." In this EA, the Corps has described the feasibility and expected environmental impacts of implementing the Proposed Action. This EA and the accompanying Feasibility Study was circulated for a 30-day review period in January 2003. Comments received in the District after the official 30-day review period were also accepted and addressed.

The District received over 300 comments from interested citizens and groups. Many of these addressed similar issues. To address the comments in an effective manner, they were grouped into general categories and summarized where possible to eliminate repetition. The District responses to the grouped and summarized comments are contained in the Coordination Appendix found at the end of this report. Copies of individual letters sent to the District in response to the Draft Report are also contained in the Coordination Appendix.

# **2 THE PROPOSED ACTION**

The Proposed Action is described in two steps:

- i. The Corps will reallocate 10,000 acre-feet (4.13% of usable storage) of Youghiogheny River Lake storage from water quality storage to water supply storage, and
- ii. The Corps will modify the water release schedule to meet the request for water supply and to better enhance lake recreation by slowing the rate of drawdown through the summer and early fall recreation season. This proposed change will conserve water early in the year, and will allow the discharge of additional water downstream during the summer and early fall when the increased flow will be needed. The proposed change to the release schedule will not adversely affect the flood control capabilities of Youghiogheny River Lake.

The modified release schedule will provide an additional flow of 25 cubic feet per second (cfs) over approximately 75 days per year. This change would maintain the one in 10-year, seven-day, low flow ( $Q_{7-10}$ ) of 460 cfs at Connellsville, PA as stipulated in the Sponsor's water withdrawal permit by PADEP.

The Sponsor will withdraw the needed water from the Youghiogheny River at their existing water treatment plant in South Connellsville. There will be no structural changes to the Youghiogheny Dam or the Sponsor's water intake/treatment facilities as a part of the Proposed Action. There will be no excavation or ground-disturbing activities associated with any part of the Proposed Action.

The reallocation assumes all reservoir inflow would be allocated to low-flow augmentation and that any water supply contract would be a purchase of water storage, not a specific yield. This means that as water becomes scarce in drought conditions, the storage for water supply is used prior to the storage for low-flow augmentation and any recharge during a drought is allocated to low-flow augmentation. The purchased water supply storage in the Youghiogheny River Lake would not guarantee the Sponsor a specific yield.

The Proposed Action would not affect the flood storage capacity of the Youghiogheny River Lake or the ability to respond to downstream water quality problems in the event of an acid mine drainage event. Flood storage and low flow augmentation for water quality would remain the primary project purposes.

### **3 ALTERNATIVES CONSIDERED AND THEIR ENVIRONMENTAL IMPACTS**

#### **3.1 Alternative A**

This alternative would be the same as the Proposed Action with the exception that the release schedule would only be changed to meet the current water supply request. There would be no changes made to the release schedule to enhance in-lake recreation. This is "Alternative 5" of the various storage-release schedules evaluated during the Feasibility Study.

##### **3.1.1 Impacts of Implementing Alternative A**

When the release schedule is changed to only meet the water supply needs, the change to the hydrology is virtually indiscernible from the current conditions in the river and the Youghiogheny River Lake (i.e., less than a 2 foot increase in reservoir pool elevations, during summer months, under wet, dry, and average conditions). Being substantially similar to the current conditions, the associated environmental consequences of Alternative A would be so small that they would be below the ability to reliably quantify.

However, because there would be no changes made to the release schedule to enhance other project purposes, there would be none of the associated benefits to the Youghiogheny River Lake from holding the summer pool for an extended period into the recreation season. For this reason, Alternative A was not selected.

### **3.2 Alternative B**

The Sponsor will meet their water supply needs by constructing a new impoundment near the mouth of Indian Creek (downstream of the existing dam on Indian Creek). Conceptual design indicates the dam would have a watershed of approximately 121 square miles and have a total dam height of 226 feet (MAWC, 1997). At maximum pool, the storage volume would be approximately 70,600 acre-feet. The estimated cost for the project is approximately \$65,662,800 dollars (USACE, 2001b).

#### **3.2.1 Impacts of Implementing Alternative B**

This alternative water supply would be used to supplement withdrawals from the Youghiogheny River. Construction and operation of a new reservoir would involve impacts from the construction (e.g., materials acquisition and transportation, land clearing and habitat loss, disturbance and/or inundation of historic/cultural properties) and operation (e.g., water quality effects because reservoir discharge to the Youghiogheny River would likely be warmer than the Youghiogheny River Lake discharge). Because of the expense and greater environmental impacts associated with constructing an impoundment on Indian Creek, Alternative B was not selected.

### **3.3 Alternative C - No Action**

The No Action alternative represents the most likely future condition without modification of the Youghiogheny River Lake Project purposes, storage allocation, or water release schedule.

#### **3.3.1 Impacts of Implementing Alternative C – No Action**

The no action alternative would use the current Youghiogheny Lake release schedule and would not reallocate storage from low flow augmentation to water supply nor add water supply as a project purpose. Under this alternative, the improvements to the lake by maintaining the summer pool for a longer period and providing a more stable river flow regime would not be realized. This would also force the Sponsor to obtain an alternate source of water supply thereby potentially leading to greater environmental damage in their provision of the alternate water source.

### **3.4 Alternatives Eliminated from Detailed Consideration**

#### **3.4.1 Revise the Sponsor's Withdrawal Permit**

The Sponsor examined the potential to simply petition the Pennsylvania Department of Environmental Protection (PADEP) to amend their water allocation permit to provide the sufficient supply. This request was denied.

#### **3.4.2 Direct Withdrawal from the Youghiogheny River Lake**

Early in the Reconnaissance phase of the alternative evaluation, the Corps examined the possibility of having the Sponsor withdraw the water directly from the Youghiogheny River Lake. This would guarantee a fixed quantity of water (firm yield) to the water company. However, the costs of this approach would be much higher than the storage reallocation and withdrawal from existing facilities in South Connellsville. Direct withdrawal would require an extensive trunk-main connection to the water treatment plant or the construction of a pre-

treatment plant as well as the construction of intake and pump facilities at the Youghiogheny River Lake. All of these activities would have the potential to negatively affect wetlands, riparian habitat, shoreline, and an extensive construction right-of-way alignment for a new trunk main.

This alternative would also eliminate any incremental benefits for the non-consumptive downstream users between the dam and South Connellsville because the reallocated storage would not be released to the river prior to intake in South Connellsville. Because of the above-stated reasons, this alternative was eliminated from detailed consideration.

### **3.4.3 Structural Modifications to the Project to Increase Storage**

The possibility of modifying the structures of Youghiogheny River Lake to add additional storage for water supply has been previously studied (USACE, 1981). Two specific cases were considered: (1) increasing the summer pool elevation from 1439' to 1441' and a full pool elevation from 1470' to 1471.5'; and (b) increasing the summer pool elevation from 1439' to 1444' and full pool elevation from 1470' to 1474'. The first example would provide an additional 5,500 acre-feet of storage and the second an additional 14,500 acre-feet.

The first case would not provide sufficient additional storage to meet the water supply needs, and the second case results in significant loss of recreational structures within the Youghiogheny River Lake. Structural changes to increase the storage in the Youghiogheny River Lake are therefore not considered reasonable alternatives.

## **4 THE AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS**

### **4.1 Project Features and Hydrology**

#### **4.1.1 Youghiogheny River Dam**

The dam consists of a rolled earth fill, impervious core structure with an uncontrolled side channel spillway and a crest elevation of 1,468 feet. The top length of dam is 1,610 feet and the maximum height is 184 feet above the streambed elevation of 1,316.64 feet. The outlet works consist of an intake orifice, 18 feet wide by 110 feet long, slanted at a 34-degree angle from the horizontal. The invert is at elevation 1328.5 feet and the top is at elevation 1389.5 feet.

The discharge is controlled by three service vertical lift gates, 4.25 feet wide and 20 feet high at invert elevation 1316.4 feet. The outlet also includes a concrete lined tunnel, 1,800 feet long and 16 feet in diameter.

#### **4.1.2 Hydropower**

A Federal Energy Regulatory Commission (FERC) license for construction of a retrofit non-Federal hydroelectric generating facility at Youghiogheny Dam was granted in 1985. Construction of the facility, now operated by D/R Hydro Company, began in February 1988 and the plant has been operational since December 1989.

The hydroelectric plant is located near the east abutment and on the downstream side of the dam. It is adjacent to the downstream end of the outlet tunnel and utilizes flow drawn through a penstock that splits off the tunnel. The project's total rated generating capacity was 7 megawatts (MW) at licensing, and is currently 12 MW.

The hydropower plant operates run of river; the volume of water released determines power generation. When the water discharge is greater than the turbines can accommodate (which occurs when flow exceeds 1,600 cfs) the wheel gate directs excess water to the stilling basin.

Under the FERC license, D/R Hydro is required to maintain a minimum dissolved oxygen concentration of 7.0 mg/l in the tailwaters. To meet this minimum requirement during the summer season, they utilize blowers to force air into the water as it is discharged.

#### **4.1.3 Youghiogheny River Downstream of the Youghiogheny River Lake**

The river has generally been viewed as having two reaches in Pennsylvania; one from the dam near Confluence to Connellsville, and one from Connellsville to the confluence with the Monongahela River at McKeesport. Each reach has distinctive characteristics.

Just downriver from the Youghiogheny Dam (in the town of Confluence), the Youghiogheny River meets with a major tributary, the Casselman River. Just upstream of this location is another confluence where Laurel Hill Creek flows into the Casselman River. From Confluence, the Youghiogheny River flows approximately 29.5 miles in a northwesterly direction through Fayette County, PA to Connellsville, PA. The river typically flows through steep-sided walled valleys and is not easily accessible over most of the reach.

The river reach from the Youghiogheny Dam to Connellsville, PA is characterized as possessing remarkable scenic, recreational value and supporting abundant fish and wildlife habitat. The reach below Ohiopyle, PA is popular for white water rafting and is characterized by rapids separated by pool areas. The rapids generate significant mixing of water, providing increased dissolved oxygen in the water.

Downstream of Connellsville, the river flows with less of a gradient for another 45 miles to the mouth at McKeesport, PA. At McKeesport, the Youghiogheny River joins the Monongahela River in Pool 2, about 15.6 miles above its confluence with the Ohio River, in Pittsburgh, PA. A 4.2-mile reach of the Youghiogheny River, upstream of its mouth, is slackwater from the Monongahela River Pool No. 2.

The lower reach can be characterized as more developed and more accessible, with several small towns and agricultural areas along its length. Industrial land use becomes more common in the downstream portions of this reach. Acid mitigation and pollution control have improved the water quality and fertility of this reach in recent decades. Several high quality warm-water and cool-water sport fisheries are supported in the river between Connellsville and McKeesport.

#### 4.1.4 Youghiogheny River Lake and Operations

The Youghiogheny River Lake is surrounded by high, rounded hills with steep slopes, deeply cut by narrow stream valleys that join with the river valley below. Near the reservoir itself, the hills rise 400 to 500 feet above the reservoir with typical slopes exceeding 50 % grade.

The Youghiogheny River Lake operations are dictated by an approved storage and release schedule to meet the primary project purposes of flood control and water quality. The flood control schedule was developed after a study of the floods during the period of record and the theoretical floods that could occur during the life of the project. The regulation of the lake for low flow augmentation is based on the stream's natural flow at Connellsville, PA and available reservoir storage conditions.

As depicted in Table 2, the reservoir has a permanent storage of 5,200 acre-feet (1,344 feet), a summer pool of 154,500 acre-feet (1,439 feet), a maximum winter pool of 103,000 acre-feet (1419 feet), and full pool capacity of 254,000 acre-feet (1,470 feet).

Full pool would only be reached during a period of extended and extreme flooding; during the entire time the project has operated, full pool has never been reached. The record pool elevation on the Youghiogheny River Lake is 1460.95 feet (approximately 222,780 acre-feet) in April 1993. At that elevation, the pool remained approximately 9 feet below full pool.

**Table 2. Youghiogheny River Lake Storage**

	<b>Permanent Storage</b>	<b>Winter Pool</b>	<b>Summer Pool</b>	<b>Full Pool</b>
Water Volume (acre-feet)	5,200	103,000	154,500	254,000
Surface Elevation in Feet (NGVD)	1,344	1,419	1,439	1,470
Flood Control Storage Available (acre-feet)	249,800	151,000	99,500	0

The difference between the winter pool and the summer pool (1419/103,000 acre-feet and 1,439 feet/154,500 acre-feet, respectively) reflects the annual filling and draw down cycles of the current reservoir operations.

When the original storage and release schedule was established, the typical filling rate for the reservoir was determined based on precipitation for the three-month period preceding May 1. Since the months of February, March and April are normally high runoff months, it was assumed that practically all of the flow from the reservoir tributary area would be available for storage retention during these months. Therefore, if the reservoir were at winter pool (1419 feet) by mid-February, the reservoir should be filled to summer pool (1439-1441 feet) by May 1 practically every year.

During this period, water accumulates in the reservoir raising the surface elevation by approximately 20 feet (1,419 to 1,439 feet) and adding an additional 51,500 acre-feet (103,000 to 154,500) to the volume of water held in the Youghiogheny River Lake.

Summer drawdown occurs between June and November, depending on runoff and downstream requirements. By the end of November, the pool is scheduled to be drawn down to at least elevation 1419 feet to provide a minimum flood control storage reserve of 151,000 acre-feet. Typically, the winter pool (1419 feet) is reached by the end of November (USACE, 1981).

During the period from December through February, the reservoir pool should not exceed the elevation of 1419 feet except during flood storage periods. Below elevation 1419 feet, excess flood flow is stored and released as conditions warrant. After February, reservoir operations dictate the re-filling cycle again be repeated as described above.

#### **4.1.5 Drought Contingency Plan**

Many citizens have expressed concern about the Proposed Action and its effect on the Youghiogheny River Lake and River during drought conditions. The following is a summary of the Corps' Drought Contingency Plan wherein the management of the project during drought conditions is described.

In 1990, the Pittsburgh District prepared a Drought Contingency Plan (DCP) for the Youghiogheny River Lake Basin. Revised in 1992, the primary value of the DCP is in identifying drought conditions, documenting data needed in decisions, and defining the coordination needed to manage the basin's water resources to ensure that they are used in a manner consistent with the needs that develop.

The District has established three drought-action levels in response to a worsening drought situation. These levels correspond to the stages that are declared by the Commonwealth of Pennsylvania for the portion of the Youghiogheny River Basin located in Pennsylvania and by the State of Maryland for the portion of the basin in Maryland. The three stages (levels) are: drought watch, drought warning, and drought emergency. The Pittsburgh District, in recognition of the potential water needs that might develop during severe droughts, has developed a strategy for necessary actions and coordination needed to meet these potentialities.

Storage levels in the Youghiogheny River Lake are used as the primary drought stage indicator for regulation purposes. As uncontrolled stream flow diminishes, water is released from the lake to augment flow according to the storage and release schedule. As routine releases continue and compensatory inflow does not occur because of drought conditions, the lake levels drop. The Corps has established tabular information correlating the time of year and pool level in the lake to determine what drought action level (watch, warning, or emergency) is appropriate (USACE, 1992).

The Commonwealth of Pennsylvania and State of Maryland both require all water purveyors to develop and annually update a drought contingency plan. These plans set forth the procedures for conservation of water and other measures according to the drought action level that has been declared (USACE, 1992).

During a drought, and to the extent possible during periods of low precipitation which may lead to persistent drought conditions, all levels of water users and water resource managers (including



the Corps) will be taking actions to conserve vital water resources. In addition, as meteorological conditions worsen during a prolonged period of drought the Youghiogheny River Lake releases will be as directed under the DCP, not necessarily according to the normally-used storage and release schedule.

Water purveyors purchasing storage in the Youghiogheny River Lake as part of the Proposed Action understand that they only purchase storage and that the storage may or may not have water in it depending on the hydrological conditions. There is no guarantee of a specific yield to the water purveyors associated with this Proposed Action and their water withdrawal permits reflect that they must operate according to their own drought contingency plans during such an event.

#### **4.1.6 Hydrology and Operational Impacts**

##### **4.1.6.1 Youghiogheny River Lake**

Implementation of the Proposed Action would result in a slower rate of drawdown from summer pool to winter pool. Figures 2 and 3 graphically illustrate the comparison between the current and Proposed Action reservoir drawdown. The decreased slope of the drawdown curve in the early summer months clearly demonstrates that the pool is being drawn down more slowly in the early part of the summer thus resulting in a longer period of recreation.

As depicted in Table 3, the Proposed Action results in holding the summer pool longer into the summer and a predicted pool elevation increase (relative to current drawdown) of as much as 14 feet during late summer and early fall under wet and average conditions. All of the changes presented are relative to the typical reservoir levels during the seasonal drawdown. As stated previously, the normal winter and summer pool elevations are unchanged because of implementing the Proposed Action; these levels are required to maintain the flood control capacity of the reservoir.

**Table 3. Projected Water Elevation Changes Relative to Current Drawdown\* (feet)**

<b>Precipitation</b>	<b>July</b>	<b>August</b>	<b>September</b>	<b>October</b>
Dry	+1	+3	+1	+5
Average	+1	+5	+7	+14
Wet	+2	+6	+9	+12

\*As projected for the end of the month.

Source: Reservoir and Riverine Modeling section, Feasibility Report

This predicted increase represents a very small change in the early summer, but the difference is greater as the summer and early fall progress. With a change in summer operation of the Youghiogheny River Lake under the Proposed Action, drawdown throughout most recreation seasons would occur more slowly than under present conditions.

One of the most frequent public complaints concerning the Youghiogheny River Lake is the rapid summer drawdown and the negative effect on recreation. Therefore, the proposed change in operation would constitute a benefit to recreational use since it delays the summer drawdown until later in the recreation season. During drought years, drawdown of the lake would closely approximate that which occurs now under the current release schedule and represents no significant change.

#### **4.1.6.2 Youghiogheny River**

As shown in Figure 4, the changes to the current release schedule to implement the Proposed Action increases  $Q_{7-10}$  flow rates at Connellsville to 489 cfs, or 29 cfs above the current 460 cfs  $Q_{7-10}$  at Connellsville. Figures 5 and 6 illustrate the predicted change to the Youghiogheny River Stage Duration and the Youghiogheny River Flow Duration measured at Confluence, PA. These figures reflect the predicted changes to the river level at Confluence and the controlled release (measured in cfs) from the dam. When discharge is increased during the seasonal low-flow summer months, the river level would be expected to rise an additional 1.5 inches over the current level. The seasonal maximum and minimum of flow would remain substantially the same.

An associated positive effect from the Proposed Action is that all downstream non-consumptive users would continue to have access to this water and derive incremental benefits from these reallocated quantities released more uniformly across the year. For example, because the water is not withdrawn from the Youghiogheny River until it reaches South Connellsville, the increased discharge throughout the typically driest months (July, August, September) will contribute to improving recreation and fishery benefits in this reach.

Downstream of Connellsville, the flows currently experienced during this dry time of the year (July, August, September) will remain as it is now because the amount of water being withdrawn by the water intakes (17 mgd/25 cfs) is the same amount by which the Youghiogheny River Lake discharge is being increased during that same time. Because the amount being withdrawn is the same as the incremental increase being added to the river, there will be no change to the water quantity downstream from Connellsville.

No significant environmental effects are predicted related to the changes in water quantity in the Youghiogheny River Lake or the Youghiogheny River.

## **4.2 Geology, Soils, and Erosion**

### **4.2.1 Geology**

Youghiogheny River Lake is located in the Allegheny Mountains section of the Appalachian Plateau Physiographic Province. The Appalachians have a geologic history of sedimentation, deformation, and erosion. Sedimentary rocks that compose the Appalachians were deposited as sediment in a shallow sea during the late Paleozoic Era, about 350 million years ago. Two hundred million years ago, the region was uplifted and the rocks were deformed, forming the Appalachians. Erosion has since rounded them, subdued their height, and dissected them with deeply entrenched streams. The Appalachian Plateau slopes westward from the Allegheny Front, which is associated with and parallel to the nearby Laurel Ridge.

Youghiogheny River Lake is situated in a steep-sided valley with exposures of the sedimentary bedrock rock strata. These strata are composed of sandstones, siltstones, shale, and limestone. Notable rock outcroppings occur at Mill Run and below the dam. The lower portion of the basin is underlain by a variable series of sandstones, shales, indurated clays, thin limestones, and occasional thin seams of coal belonging to the Allegheny and Conemaugh formations of the Pennsylvania Age.

The regional geologic characteristics have, in many respects, dictated the area's history due to the abundance of coal throughout the region. While coal mining sustained local economies and provided citizens with jobs, the legacy of resource extraction degraded water quality and was one of the primary project purposes for construction and operation of the Youghiogheny River Lake. Although greatly reduced by mitigation activities throughout the watershed, the acidic drainage from coalmines continues to be a primary factor affecting water quality in the Youghiogheny River and many of its tributaries.

#### **4.2.2 Soils**

The soils of the Youghiogheny River Lake area developed from weathered sedimentary rock, including sandstone, siltstone, shale, and limestone. The majority of soils found in the project area are of three general soil associations. The Gilpin-Wharton-Ernest association predominates in the Fayette County, Pennsylvania, portion of the project. This association includes upland soils, moderately deep and deep, well-drained and moderately well-drained, medium-textured, nearly level to very steep soils underlain by acid shale and some sandstone bedrock. The Somerset County, Pennsylvania, portion is predominantly the Rayne-Gilpin-Wharton-Cavode association. This association includes much of the same types of soils as the Gilpin-Wharton-Ernest association, except that it typically includes level, somewhat poorly drained soils. The Gilpin-Wharton-Dekalb association, predominant in the Maryland portion of the project, is gently sloping to steep, moderately deep and deep, well-drained and moderately well-drained soils formed over acid, gray to brown, soft clay shale to hard sandstone.

In addition to these soil associations, two other associations occur in relatively small areas of the project. The Monongahela-Philo-Atkins association occurs below the dam. These soils are level to gently sloping, deep, moderately well-drained and poorly drained, medium-textured soils occurring on stream terraces and floodplains. The Dekalb-Gilpin-Cockport association occurs at the upper end of the reservoir. This association includes gently sloping to steep, moderately deep, well-drained and moderately well-drained, very stony soils formed over acid, gray to yellowish sandstone and shale.

Predominant soils throughout the project lands are both residual and colluvial types, while some small deposits of alluvial soils are located at the water's edge and in adjacent stream valleys. In general, the colluvial soils are poorly drained, very steep, unstable, and erodible. The alluvial soils are subject to flooding, they have a high water table, and some are poorly drained. The better drained, more stable residual soils are the most suitable for development, but they still have the limitations of shallow depth to bedrock, stoniness, and slope.

#### **4.2.3 Erosion**

The landscapes within the project area have evolved because of post-glacial erosive processes (e.g., sheet/rill erosion, channel incision, land sliding, and gullying). The energy associated with the seasonally highest flows in the river cause the greatest erosion downstream of the dam. During peak flows in the river, the greatest contribution to flow is not from the Youghiogheny River Dam releases, but from the uncontrolled flow of all other tributaries.

Above the dam, erosion occurring in the watershed results in the deposition of silt at the mouths of streams entering the reservoir. The change in flow velocity results in rapid settling of silt that occurs as small deltas or alluvial fans. Where the Youghiogheny River enters the reservoir, there are extensive mud flats due to sedimentation and water level fluctuations. Submerged aquatic vegetation does not develop or persist on these flats due to the extremes in water levels associated with routine project operation. Some seasonal herbaceous growth develops occasionally in the Buffalo Run and Selbysport areas, but these are not perennial and perish when seasonally inundated.

The most recent sedimentation survey (USACE, 1999) confirms that sedimentation has not greatly affected the flood capacity of the reservoir.

#### **4.2.4 Geology, Soils, and Erosion Impacts**

Because the Proposed Action does not involve any changes to the summer or winter pool, does not have any physical changes to the infrastructure of the reservoir, dam, discharge, river shoreline, or water intakes, there is no potential to have any environmental effects on geology or soils different than the existing conditions.

The potential of the Proposed Action to exacerbate downriver erosion because of the increasing flow has been identified as a concern in public meetings. While there will be changes to the release schedule associated with the Proposed Action (as shown in Figures 5 and 6), the changes will not discernibly affect the magnitude of the largest (and most erosive) flows in the river. No significant erosion impacts would occur.

### **4.3 Meteorology/Climate**

The project is located in the temperate continental climatic zone, a region of seasonally widely varying temperatures, and moderate, year-round precipitation increasing slightly during the warmer months.

Temperatures in the area vary from mean daily maximums and minimums of 82.5°F and 57.0°F in July to 36.5°F and 17.7°F in January. The temperature has reached 90°F or above an average of five days a year and freezing temperatures have occurred an average of 125 days a year. The length of the frost-free period varies from one part of the project to another due to differences in topography. Precipitation varies from year to year but has averaged approximately 42 inches annually at Confluence. Measurable precipitation has fallen an average of 102 days per year.

#### **4.3.1 Meteorology/Climate Impacts**

The Proposed Action would not have any effects on the regional meteorology or long term climate and the EA will give no further consideration to these issues.

### **4.4 Air Quality**

The EPA Office of Air Quality Planning and Standards has set National Ambient Air Quality Standards for six principal pollutants, called "criteria" pollutants. They include carbon monoxide, nitrogen dioxide, ozone, lead, particulates, and sulfur dioxide. None of the standards set by EPA for these pollutants are exceeded in the project area.

#### **4.4.1 Air Quality Impacts**

Because the Proposed Action does not involve the creation of or changes to any fugitive or point source air emissions, the EA will not consider air quality.

### **4.5 Water Quality**

#### **4.5.1 Youghiogheny River Lake**

The lake can be characterized as a relatively cool impoundment that exhibits summer thermal stratification. Typical of reservoirs with bottom discharge, inflow and discharge processes are significant factors in the vertical advection of heat. Throughout the summer months, the strata of cold, relatively dense water impounded in the spring are withdrawn and replaced by overlying strata that have been warmed by water surface heat transfer, solar absorption, and warm summer inflows (USACE, 1997).

Because of the bottom-discharge induced vertical advection of heat, Youghiogheny River Lake is warmed to considerable depth by late summer. However, the depth of the reservoir (54.3 ft mean depth/121 ft. maximum depth), limits warming from solar radiation; the temperature of the spring storage (<20 degrees C), and other factors leave the Youghiogheny River Lake able to support a "two tier" (i.e., warm and coldwater) fishery (USACE, 1997). The cool reservoir discharge (rarely exceeding 20 degrees C) is critical to the maintenance of the coldwater trout fishery in the tailwaters and the Youghiogheny River itself.

The Youghiogheny River Lake can be characterized as being well-aerated to considerable depths year round (USACE, 1996). Anaerobic conditions (1.0 mg/l DO or less) are present only near the sediment-water interface in the very deepest reaches of the reservoir below the intake structure for the discharge (USACE, 1996). The minimum dissolved oxygen concentration necessary for the survival of most fish is approximately 4.0 mg/l. In the deepest portion of the reservoir (near the dam), dissolved oxygen concentrations less than 4.0 mg/l are generally not found at depths less than 80 feet during the summer months. In the reservoir's shallower upstream portion, dissolved oxygen concentrations less than 4.0 mg/l are not usually encountered at depths of less than 30 feet during summer stratification (USACE, 1996).

Bottom withdrawal acts to minimize summer anaerobic conditions in the deeper portions of the reservoir by continuous evacuation of hypolimnetic water. There is no significant loading of oxygen-demanding waste materials from upstream municipalities or industries (USACE, 1996).

The Youghiogheny River Lake is considered a fragile aquatic system because of very low alkalinity and a low level of productivity (USACE, 1997). The Commonwealth of Pennsylvania Fish and Boat Commission (PAF&BC) reviewed the reservoir's water quality data and concluded that (using alkalinity as a measure of basic fertility) the grand mean annual alkalinity value for 1975 to 1977 was 11 mg/l, and that the value 20 years later (1995 to 1997) was 11 mg/l (PAF&BC, 1999).

Steep-sided reservoirs are considered oligotrophic where littoral plants are scarce, plankton growth and organic matter are low in proportion to the total volume of water, and there are low concentrations of phosphorus, nitrogen, and calcium. The lake has a mean alkalinity of 9 mg/l; a minimum of 20 mg/l is considered required for a lake to be considered productive and fertile (USACE, 1997).

Historically, the lake had low pH values due to acid mine drainage, which had detrimental effects on the fishery. The majority of these mines have been closed or reclaimed, and low pH values have not been observed in the past few years. There are no known sources of sanitary sewage on the Youghiogheny River Lake, although several are suspected. Houses located along the lakeshores have septic systems with leach fields in shallow soils that are marginally suited for this use. The marina does not currently offer any sewage disposal facilities for boaters, but they have purchased a tank to allow for disposal of sewage from boats using Youghiogheny River Lake. The tank will be available as soon as the necessary permits are obtained.

Fecal coliform, a bacterium found in sewage, is measured at the beach and has not exceeded state or federally regulated levels. If fecal coliform levels remain low at the monitoring sites and nutrient levels remain the same, sanitary sewage does not appear to represent a problem in the reservoir. Nevertheless, efforts to reduce the potential for sewage discharge into the reservoir should be continued.

Corps employees conduct periodic biological and chemical sampling to document and monitor changes in water quality in the tailrace, lake, and tributaries. Corps biologists initiated adult aquatic insect sampling in the tail waters of the Youghiogheny Dam in 1991 in order to determine biological baseline conditions, and to monitor changes in water quality. The Youghiogheny River Lake inflow was sampled for the same purpose in 1992, and several tributaries were sampled between 1994 and 1999, including Mill Run, Buffalo Run, Tub Run, and Hall Run.

#### **4.5.2 Youghiogheny River**

The downstream summer season cooling effect of Youghiogheny Dam releases is substantial, but is moderated by the mixing with the Casselman River 1.2 miles downstream of the dam. The extent of this moderation varies as the uncontrolled flow of the Casselman River varies relative to the release from the Youghiogheny Dam. Summer warming from ambient air temperature, and other tributaries generally means that the summer water temperature regime of the river at Connellsville, PA (river mile 44.7) has warmed to the point that it is very similar to that of the Youghiogheny River inflow into the lake at Friendsville, MD (USACE, 1996).

The Youghiogheny River meets Pennsylvania Fish & Boat Commission classification criteria for “approved trout waters” along a 29 mile reach of river between the dam and South Connellsville, PA (USACE, 1996). Downstream of South Connellsville, the river warms to a point where conditions no longer support a year-round coldwater fishery (USACE, 1996).

During summer stratification, anoxic conditions (dissolved oxygen levels of 1 mg/l or less) can persist near the reservoir intake invert. The wheel gate discharge is turbulent and oxygenates the discharge waters as they are released. The hydropower releases are less turbulent and can fail to adequately oxygenate their discharge. However, under their FERC license, D/R Hydro is required to maintain a minimum dissolved oxygen concentration of 7.0 mg/l in the tailwaters. To meet this minimum requirement, during the summer season they utilize blowers to force air into the water as it is discharged. Water Quality modeling predicted that dissolved oxygen levels in the lake discharge intakes would be low enough (<7 mg/L) to require blower operation for 126 days in 1991 and 109 days in 1992 (ATS, 2000).

The storage re-allocation is possible because the water quality of surface inflows downstream of the dam has improved dramatically. Historic data (USACE, 1978) show that from 1953 to about 1975 Youghiogheny Dam releases were chronically overwhelmed by gross acid mine drainage (AMD). It wasn’t until the mid-1970s that the AMD load from the Casselman River decreased to the point where the Youghiogheny Dam releases were able to consistently maintain pH values greater than 6.0 in the river.

Currently, summer season pH values on the Casselman typically do not violate Commonwealth standards (pH 6.0), and often exceed the pH of the dam outflow (USACE, 1996). This improvement in water quality has largely eliminated the need for water quality releases from the dam during higher Casselman River flows, allowing an opportunity to increase base flow augmentation for water quality and other potential purposes.

Improvements in AMD from the Casselman River have been so effective that pH data from the Casselman, when compared to pH data from the Youghiogheny River, indicate that the Youghiogheny River Lake discharge is now more acidic than the Casselman (USACE, 2001a). See Figure 7 where CNFP represents the data collected from the Youghiogheny River downstream from Confluence, PA and MAKP represents a data collection point on the Casselman River upstream from the co-mingling with the Youghiogheny River. The 1998 mean pH for the Casselman sample point was 7.5 (max 9.1/min 6.5) and the mean pH value for the Youghiogheny River was 6.63 (max 7.54/min 6.24) (USACE, 2001a).

Winter/spring AMD problems have occasionally occurred (incidents in 1993,1994) (USACE, 1996) outside the existing summer season low-flow augmentation period, but these would not be affected by the proposed revisions to the summer/fall seasonal release schedule (USACE, 1996). In the event of an AMD problem, the water quality needs take primacy over water supply concerns.

Some individuals have voiced concern that, as a result of the proposed changes to the release schedule at Youghiogheny River Lake, there will be less water available for dilution of contaminants, especially sewage and fecal bacteria.

In order to evaluate this concern, one must first understand a few basic concepts of the actual problem. First, the fecal load (into the Youghiogheny River) is not related to releases from Youghiogheny River Lake. Second, the “problem” is at its worst, when the volume of water available for dilution (from Youghiogheny Lake releases), is minimized.

From the basic concepts outlined above, the problem of fecal contamination will be at its worst during the late summer months, when flows in the Youghiogheny are at their lowest. It is during this time frame that the proposed revised release schedule increases the release from the dam, by the same volume as the proposed withdrawal from the Youghiogheny River. Therefore, the volume of water available for dilution remains the same. This revised release will occur in all but the years experiencing an extreme drought.

During a year of extreme drought, one where Youghiogheny River Lake levels fall below the Drought Emergency levels outlined in the Project’s Drought Contingency Plan, the operation Youghiogheny River Lake becomes one of minimizing the releases while maintaining the minimum pool. If conditions deteriorate to the point where minimum pool is reached, the outflow will be set to the computed inflow. This procedure is identical to the Project’s Drought Contingency Plan currently in place at Youghiogheny River Lake. This procedure is consistent the other Drought Contingency Plans for all of the Multi-Purpose Flood Control Projects owned and operated by the Pittsburgh District of the Corps of Engineers.

### **4.5.3 Water Quality Impacts**

#### **4.5.3.1 Youghiogheny River Lake**

Because the Proposed Action will result in holding the summer pool for a longer period during the summer months, there could be a decrease in the dissolved oxygen levels in the Youghiogheny River Lake in proximity to the water discharge intakes. As discussed above, water at this deep portion of the lake is cooler and oxygen deficient. At levels less than 7 mg/l, the D/R Hydro operates low-pressure blowers that aerate intake water. These blowers are typically operated between mid-July and mid-October.

To quantify the expected increase in the number of days the blowers would need to operate, dissolved oxygen levels at the intake elevation of the lake were modeled for 1991, a very dry year, and 1992, a normal to wet year. During a dry year there would be essentially no change (three fewer days) in the number of days the blowers would need to operate to mitigate insufficient dissolved oxygen in the discharge waters. Because of the higher pool maintained during a normal to wet year, the model predicted the blowers would need to operate 11 days more than under current conditions. The increase in the number of days where D/R Hydro must operate the blowers will not be a significant environmental impact because the mitigation to Nitrogen Supersaturation in the aquatic life (See section 4.7.4 for a complete discussion) is being developed by D/R Hydro to comprehensively address this chronic problem.



#### **4.5.3.2 Youghiogheny River**

Utilizing the information derived from the Proposed Action modifications to the release schedule, dissolved oxygen levels were modeled at four stations (Confluence, Ohiopyle, Connellsville, and McKeesport) along the river for 1991 and 1992. Model results for the Proposed Action predicted dissolved oxygen levels exceeding 7 mg/l throughout the entire river downstream of the dam under normal to wet conditions. During the dry year (1991), modeled results predicted dissolved oxygen levels below 7 mg/l for *both* the existing conditions and the Proposed Action at McKeesport. Therefore, no negative environmental effects to the dissolved oxygen in the Youghiogheny River were predicted from implementing the Proposed Action.

Under the existing release schedule, the relatively cool water from the lake is released for diluting the formerly polluted and relatively warmer water from the Casselman River. Under the Proposed Action's release schedule, the water in the lake would be slightly cooler because of the higher pool elevations; however, less water would be released during peak discharges to dilute the Casselman, resulting in slightly warmer temperatures in the Youghiogheny River between Confluence and McKeesport. These "slightly warmer" peak discharges typically occur during spring runoff when water temperatures are naturally low. During the August – September low-flow, when water temperatures are the highest, the proposed release schedule would result in more water being discharged.

The PA Fish and Boat Commission considers 20 degrees Celsius as the "rule of thumb" threshold high water temperature to maintain a high quality cold water fishery. For a normal to wet year, the modeling results essentially predict no change in the number of days exceeding 20 degrees C. The model predicted five more days exceeding 20 degrees C at the Ohiopyle location during dry year conditions.

After reviewing the temperature data, the PA Fish and Boat Commission confirmed that these projected changes are not expected to have any significant negative effect on the cold-water fishery (PAF&BC, 2000). At the recommendation of the PAFBC, a continuous water temperature monitor has been installed at the Youghiogheny River gaging station at Connellsville. This station augments continuous water temperature data already being collected at the Confluence and Sutersville gages. In addition, a continuous water temperature monitor will be installed at the Ohiopyle gage after construction of the new gage is completed.

## **4.6 Terrestrial Ecology**

### **4.6.1 Terrestrial Lakeshore Habitat**

The terrain surrounding the lake is mountainous and substantially vegetated with secondary growth variable age pine and mixed deciduous hardwood forest. While forest age ranges from recent woody successional stands less than twenty years old to some early cut, regenerated forest about 100-years aged, the majority of the forest is in the 60-80 year range. The lake drainage area has been estimated at 85% forested and 15% agricultural (Proch and Greiner, 1986). The entire lakeshore has steep slopes, except for those areas adjacent to incoming tributaries and the backwater area of the lake in Maryland.

Because of the maturity of forest around Youghiogheny River Lake, a wide variety of wildlife typical of mature forested areas is present. Of the many mammals present on the site, several are recreationally significant as game animals or furbearers. These species include white-tailed deer (*Odocoileus virginianus*); gray (*Sciurus carolinensis*), red (*Tamiasciurus vulgaris*), and fox (*Sciurus niger*) squirrels; Eastern cottontail (*Sylvilagus floridanus*); gray (*Urocyon cinereoargenteus*) and red fox (*Vulpes vulpes*); raccoon (*Procyon lotor*); opossum (*Didelphis virginiana*); muskrat (*Ondatra zibethicus*); beaver (*Castor canadensis*); and woodchuck (*Marmota monax*).

Many birds nest on the site and likely include green heron (*Butorides striatus*), wood duck (*Aix sponsa*), and game birds such as wild turkey (*Meleagris gallopavo*), ruffed grouse (*Bonasa umbellus*), and woodcock (*Scolopax minor*). Many songbirds are also present on the site during their nesting season. Scarlet tanagers (*Piranga olivacea*) and other neo-tropical species are especially noticeable during migration and many remain to nest in the area. In the early spring and fall, the area attracts many species of migratory waterfowl, but only in moderate numbers. Birds of prey are also present, though not abundant, and may include osprey (*Pandion haliaetus*), American kestrel (*Falco sparverius*), and various hawks and owls. The project is located on the western slopes of the Allegheny Mountains, which are heavily used by birds of prey as a migration route.

Reptiles that may be seen in the project area include wood turtle (*Clemmys insculpta*), snapping turtle (*Chelydra serpentina*), painted turtle (*Chrysemys picta*), and 15 species of snakes including the venomous Northern copperhead (*Agkistrodon contortrix*) and timber rattlesnake (*Crotalus horridus*). These venomous species are relatively rare and appear to pose no serious threat to people using the area. Bull frogs (*Rana catesbeiana*), leopard frogs (*Rana pipiens*), and red-spotted newts (*Notophthalmus viridescens*) are a few of the resident amphibians. Surveys by Corps personnel have identified six species of salamanders in a variety of upland habitats.

#### **4.6.2 Lakeshore Floodplains**

This community, located between the normal winter pool elevation and the normal summer pool elevation, near the mouths of moderately sloping tributary valleys, is subject to prolonged flooding. The dominant woody plants are silver maple (*Acer saccharinum*), eastern cottonwood (*Populus deltoids*), river birch (*Betula nigra*), black willow (*Salix nigra*), seral shrubby willows (*Salix* spp.), silky dogwood (*Cornus amomum*), and American sycamore (*Platanus occidentalis*).

The cyclic exposure and inundation of the lakeshore fringe area maintains a herbaceous ground cover of annual weeds from mid to late in the growing season. Moderate forage but minimal cover or nesting opportunities is provided for most wildlife by this transitional habitat. Dense stands of willow in frequently flooded, but topographically higher areas may be used occasionally as nesting cover by certain songbirds.

#### **4.6.3 Wetlands**

The steep topography that generally surrounds the reservoir precludes the establishment of areas of wetlands. However, wetlands have developed at or near the mouths of several tributaries to

the reservoir. National Wetland Inventory maps, developed by the U.S. Fish and Wildlife Service, provide a rough measure of the extent of wetlands at the project. The maps identify limited palustrine wetlands in the lower valleys of Braddock Run, Mill Run, Buffalo Run, Reason Run, and Wilkins Hollow and along the floodplain terraces of the Youghiogheny River west and south of Selbysport. During periods of high water, the permanent vegetation of wetlands can also serve as important fish spawning habitats. The annual inundation and flooding of shoreline areas prevents the establishment of submerged aquatic vegetation beds most important to fish production.

#### **4.6.4 Terrestrial Ecology Impacts**

Because the Proposed Action will not affect the absolute magnitude of the drawdown and refill cycle, there are no effects to the lakeshore floodplains, fringe vegetation, wetlands, or any areas of submerged aquatic vegetation expected from implementing the Proposed Action.

### **4.7 Aquatic Ecology**

#### **4.7.1 Youghiogheny River Lake**

The topography of the region prior to the reservoir's construction dictates the shoreline and bottom contours of the reservoir. The reservoir productivity is further modified by fluctuating water levels, which change the shoreline, depth, in-stream cover, and other numerous factors throughout the year. Maintenance of water level at the summer pool (1439-1441 feet) during the fish-spawning season (March 15 - June 15) is important to most fish species (PAF&BC, 1996).

The upper reaches of the reservoir where the Youghiogheny River enters exhibit lotic or riverine characteristics, while the area near the dam is more lentic or lake-like. Thermal stratification occurs near the dam, providing cold-water habitat at depth year-round, while the rest of the reservoir offers warm water habitat.

Aquatic habitat of the lake consists of areas of boulder, rubble, and gravel substrate, and fallen and inundated trees along the shoreline. The steep slopes associated with the majority of the shoreline and the exposed slopes provide very little suitable habitat for spawning, protection of juvenile fishes, attachment of macrophytes (aquatic vegetation), or substrate for benthic macro invertebrates. This problem is further exacerbated by water level fluctuations. Fish that are pelagophillic (open water spawning fish with free-floating eggs) are naturally more suited to reproduction in the reservoir. The reservoir offers an abundance of forage habitat for piscivorous fish and moderate to good habitat for planktivorous (plankton-eating) fish.

Despite the limitations, the Youghiogheny River Lake offers unique and valuable aquatic resource features. The lake provides a varied warm water, cool water, and cold water fishery and is the only lake in southwest Pennsylvania boasting a naturally reproducing walleye fishery and one of only a half dozen statewide (PAF&BC, 1996). The lake supports a diverse fish population including smallmouth bass (*Micropterus dolomieu*), walleye (*Stizostedion vitreum*), yellow perch (*Perca flavescens*), Northern pike (*Esox lucius*), tiger muskellunge (*Esox lucius x Esox masquinongy*), largemouth bass (*Micropterus salmoides*), rock bass (*Sula bassana*), black crappie (*Pomoxis nigromaculatus*), brown trout (*Salmo trutta*), bluegill (*Lepomis macrochirus*),

brown bullhead (*Ameiurus nebulosus*), and channel catfish (*Ictalurus punctatus*). Forage fish in the reservoir include golden shiners (*Notemigonus crysoleucas*), white suckers (*Catostomus commersoni*), northern hogsuckers (*Hypentelium nigricans*), carp (*Cyprinus carpio*), emerald shiner (*Notropis atherinoides*), and a variety of minnows. The stocking of alewife (*Alosa pseudoharengus*) has resulted in a very successful forage base. Brown trout are important cold-water species that have been stocked in the lower portion of the reservoir.

In 1998, smallmouth bass, yellow perch, bluegill, walleye, and crappie dominated angler catches in PAF&BC creel surveys (PAF&BC, 1999). Mean relative weight (a measure of condition) of walleye in the reservoir suggested that walleye are at densities compatible with the carrying capacity of the reservoir. The same 1999 PAF&BC study states that “Despite a concerted effort to develop a trout fishery [in the reservoir] through fingerling plants, the recent field sampling efforts recorded sparse numbers of trout present in the lake. Furthermore, there was not a great deal of angler interest directed toward trout angling in the lake. Therefore, I concur with the Area 8 recommendation to terminate the planting of fingerling trout in this water” (PAF&BC, 1999).

Local media reported that during November 1998, “anglers were getting limits of walleyes every weekend going 18 to 22 inches.” The walleye angler catch from PAF&BC creel surveys in September 1998 placed the month as the third highest in angler success behind May and June (PAF&BC, 1999). This occurred during the seasonally severe drawdown of the reservoir.

Stocking has met with mixed success in the past. The stocking of smelt eggs failed, while the stocking of alewife was very successful at providing a forage base for piscivorous (fish-eating) fish, although the annual loss of thousands (even millions) of alewife through the dam and power plant during the winter months has created fisheries management problems.

Other species of fish that have been stocked in the lake over the last 40 years include Northern pike, black crappie, yellow perch, and brown trout.

#### **4.7.2 Entrainment of Fish**

Article 41 of the FERC License for the Youghiogheny River Lake power generation required the Licensee to prepare a Study Plan to assess the potential impact of the hydropower generation on the lake’s fish resources. The study was comprehensive, continuous, full discharge entrainment netting for a period of 12 consecutive months (D/R Hydro, 1992). Overall, the entrainment of fish was found to be highly seasonal. Most fish were captured between October and March. Few specimens of any species, except yellow perch and walleye, were captured from April through July. Almost all of the 1.276 million fish entrained (99.4%) were alewife. Excluding alewife, 7,117 fish were collected in total. Of those, crappie dominated (4,723), followed by perch (1,137), walleye (618) and rock bass (356).

Entrainment is facilitated by a natural desire of fishes, particularly alewife, walleye and crappie, to move downstream in late fall. Alewife entrainment increased dramatically when water temperature declined below 6 degrees C and almost all of the alewife were entrained from December through February. The mechanisms of alewife entrainment are related to their behavioral and physiological characteristics and their abundance and distribution near the intake

as lake temperatures decline. Entrainment of the larger fish is also related to their physiological and behavioral characteristics, including some species' affinity for alewife as prey (D/R Hydro, 1992)

#### **4.7.3 Youghiogheny River**

The Youghiogheny River Lake's outflow fishery is the most intensively managed catchable trout stream in southwest Pennsylvania (PAF&BC, 1996). Trout are stocked year round (11,750 total from 11 stockings) because of the coldwater release of the reservoir (PAF&BC, 1996). The 27.5 river miles from Confluence, PA (just downstream from the dam outflow) to South Connellsville, PA is managed intensively with brown and rainbow trout stocked annually (175,000 total). That section of river also contains good populations of smallmouth bass and rock bass (PAF&BC, 1996).

The reach of river from Connellsville to the mouth at McKeesport (45 miles) has increased fertility and water temperature supporting a high quality warm water and cool water fishery including smallmouth bass, rock bass, walleye, sauger, and channel catfish (PAF&BC, 1996).

In 1998, the Chestnut Ridge Chapter of Trout Unlimited constructed a cage culture trout nursery in the Youghiogheny Dam tailrace. This was accomplished under a Memorandum of Understanding between Trout Unlimited, the U.S. Army Corps of Engineers, Pennsylvania Fish and Boat Commission and D/R Hydro Company. Growth rates of trout reared at this facility are well above average compared to trout raised in conventional nurseries. Thousands of rainbow trout and brook trout reared at this facility in 1998 and 1999 were released into the Youghiogheny River below the dam and adjacent waters. This hatchery produces trout ready for the river and various tributaries at a cost that is approximately 40 % of the cost of a conventional hatchery (CRTU, 2000).

#### **4.7.4 Nitrogen Gas Supersaturation**

Unrelated to the Proposed Action, the Corps of Engineers is working with the Hydroelectric Power operator (D/R Hydro) as they address a chronic water quality issue in the tailwater fishery. It has been established that Gas Bubble Disease develops in free-range fish and cage-culture trout residing in the tailwaters when the blowers installed by D/R Hydro to maintain minimum dissolved oxygen levels are activated (USACE, 2001). Mechanically injecting air into water discharged under pressure supersaturates the water with nitrogen. Ironically, the efforts to maintain acceptable oxygen levels in the discharge waters have inadvertently created a situation where the nitrogen is toxic to aquatic life.

Chronic exposure to low levels of water supersaturated with atmospheric gasses results in occurrence of Gas Bubble Disease in fish, mollusks, and crustaceans (USACE, 2001). During extended periods of gas supersaturation, trout being raised in the Trout Unlimited rearing pens exhibit externally observable symptoms of Gas Bubble Disease (e.g., pop eye) and suffer high mortality (USACE, 2001). The most recent electrofishing survey of the outflow (September 19, 2000) indicated that the effects of atmospheric gas supersaturation on fish were not limited to the trout being raised in the pens. Throughout the outflow, fish exhibited symptoms related to stress from Gas Bubble Disease, particularly the fish collected from the shallow water riffle habitat (USACE, 2000).

At the request of the Corps, D/R Hydro used the summer/fall of 2001 and 2002 as a data-gathering period to gather the necessary information to develop a permanent solution. Specific objectives for D/R Hydro's investigations are:

- Research and develop a means of varying the output of the existing blowers,
- Develop target values for acceptable levels of supersaturation, and
- Explore Alternate Aeration Methods, including adjustments to the main wheel gate discharge and injection of oxygen into the system.

This is an ongoing area of investigation and potential future mitigation that is unrelated to the proposed reallocation of storage and revision of the release schedule.

#### **4.7.5 Aquatic Ecology Impacts**

With respect to the Youghiogheny River Lake, there may be some positive environmental impacts from implementing the proposed action and maintaining the summer conservation pool for a longer period, improving the overall productivity, weed growth, and potentially improving fish reproduction.

The PAF&BC indicates, "a less severe annual drawdown [of the Youghiogheny River Lake] may permit more nutrients to remain in the lake and lead to some improvements in lake fertility and primary production" (PAF&BC, 1999). The effects of the Proposed Action on the lake fishery then "could provide minor improvement for fish population" (PAF&BC, 1999). Improvements would likely be difficult to measure, but the change would nonetheless result in positive long-term effects for the Youghiogheny River Lake.

The proposed reallocation and changes to the release schedule are expected to have no effect on the entrainment of fish because entrainment occurs from December – March and the Proposed Action would not result in any changes to the release schedule during that time of year.

### **4.8 Protected Species and Habitat**

Previous studies by the Corps and others as well as consultation with resource agencies have identified several protected species and/or their habitats near the Youghiogheny River Lake and downstream of the Youghiogheny River Lake Dam.

#### **4.8.1 Youghiogheny River Lake**

In 1995, the Maryland Natural Heritage Program published the results of a survey of the MD area of the Youghiogheny River Reservoir. Published under the title Youghiogheny River Reservoir Rare Species and Habitats Inventory, the report stated the following:

"Four state-listed species and other species and habitats of note were found during inventory of the Maryland portion of the Youghiogheny River Reservoir during the 1994 field season. The federal candidate cerulean warbler (*Dendroica cerulea*) and butternut (*Juglans cinerea*), and population of the state-threatened glade fern (*Diplazium pycnocarpon*) and Goldie's wood fern (*Dryopteris goldiana*), were perhaps the most important species finds. The eastern spiny

softshell (*Apalone spinifera*), last reported in 1972, was found again near Selbysport. The forest in the vicinity of a large glade and Goldie's fern population, and a mudflat across from Selbysport were determined to be special habitats. The Buffalo Run cove, already the site of a specially-regulated Nontidal Wetland of Special State Concern, continued to yield uncommon species finds." (MDNR, 1995)

At the upstream-most reach of the Youghiogheny River Lake, Maryland Department of Natural Resources indicated that the state-listed endangered Hellbender (*Cryptobranchus alleganiensis*) was known to inhabit the Youghiogheny River near Friendsville.

Presently, Pennsylvania does not have a system of formally designating special concern species of aquatic invertebrates (e.g., insects, mollusks, crustaceans). However, the Pennsylvania Biological Survey does recognize those species that are rare and warrant special consideration.

#### **4.8.2 Youghiogheny River**

There have been several specific species identified downriver of the Youghiogheny River Dam as environmentally sensitive.

One of these rare species associated with the river is Thorey's Grayback Dragonfly (*Tachopteryx thoreyi*). There are several other species of aquatic invertebrates as well as such species as Hellbender (*Chryptobranchus allegheniensis*) that are intimately linked to the river and are good indicators of changes in the river's health (USACE, 1997).

Along the rivers edge are large rock ledges or shelves that are often scoured by flooding. The designated special concern species Large-flowered Marshallia (*Marshallia grandiflora*) is associated with this habitat. Its occurrence is rare throughout the world. Within the United States, it is present within the mountainous river systems of West Virginia, particularly the southern portions of the Monongahela River Drainage. In Pennsylvania, its only known occurrence is along the Youghiogheny River between Confluence and Connellsville (USACE, 1997).

The shoreline of this portion of the river can be characterized by a very rocky/gravelly sandy floodplain and riverbank. Large boulders are common to this zone as well. Designated special concern species associated with this habitat are: Sand Grape (*Vitis rupestris*); Carolina Tassel-Rue (*Trautvetteria caroliniensis*); Golden Club (*Orontium aquaticum*); Sweet-scented Indian Plantain (*Cacalia suaveolens*); and Lobed Spleenwort (*Asplenium pinnatifidum*). Of special note, the only recently documented occurrence of Sand Grape in Pennsylvania is along the Youghiogheny River (USACE, 1997).

The designated special concern species associated with transition zones between the floodplain and toe of the slope and the very wet areas at the confluence of tributary streams are: Lettuce Saxifrage (*Saxifraga micranthidifolia*) and Mountain Bugbane (*Cimicifuga americana*) (USACE, 1997).

Because of its remote, undisturbed character, the reach of the river downstream of the Youghiogheny River Lake is one of the few areas in the Commonwealth chosen by the Pennsylvania Game Commission for the reintroduction of the river otter (*Lutra canadensis*).

This species had become extinct throughout the State, except for a few individuals in the Pocono Mountains in northeastern Pennsylvania (USACE, 1997).

#### **4.8.3 Protected Species and Habitat Impacts**

Several comments received on the Reconnaissance Report (USACE, 1997) indicated there are concerns that the proposed modification to the release schedule would change the periodicity, intensity, and duration of flooding or scouring events downriver. In particular, several species of special concern are believed to thrive in the areas subject to the dynamic changes associated with riverine systems.

The nature of the Proposed Action represents no real change in the absolute magnitude and variation of flows that will be observed downstream of the dam. Because the proposed change will be so slight and well within the variation characteristically observed on the free flowing section of the Youghiogheny River, no significant adverse impacts to this habitat or unique species are expected.

Consultation with the U.S. Department of the Interior's Fish & Wildlife Service (USDOI, 2001) provided the following comment on the Proposed Action, "Except for occasional transient species, no federally listed or proposed threatened or endangered species under our jurisdiction are known to occur within the project impact area. Therefore, no biological assessment nor further Section 7 consultation under the Endangered Species Act are required with the Fish and Wildlife Service."

Consultation with the Maryland Department of Natural Resources provided this summary: "we have no additional comments, and no objections or concerns on the proposed management schedules and the resulting minor changes to lake characteristics/levels" (MDNR, 2001).

### **4.9 Demographics and Socioeconomics**

The Feasibility Report summarizes the existing demographic and socioeconomic conditions in the area surrounding the Youghiogheny River Lake and downstream. The content of the Feasibility Study is incorporated by reference.

#### **4.9.1 Demographic and Socioeconomic Impacts**

Demographic and socioeconomic impacts are typically secondary impacts associated with implementing a proposed action. In this case, there are only minimal changes to the physical operation of the dam and the associated environment effects are minimal. Where there are no changes to the infrastructure, no construction, and no changes to facilities, the Proposed Action would be expected to result in, at the most, minor socioeconomic impacts.

The projected boating season extension on Youghiogheny River Lake would not be expected to increase employment in terms of additional jobs, but extending the season would increase labor hours and wages.

Maintaining summer pool elevations longer will also subtly affect hydropower generation at the dam by maintaining a higher hydraulic head and keeping higher flow through the power plant.



Discussions with personnel at D/R Hydro, the company that operates the hydropower facility, indicate that there is no anticipated economic impact associated with increased pool elevations, due to the seasonally offsetting effects of increased hydraulic head and decreased flow.

Holding the summer pool later into the summer is expected to also increase the number of days that D/R Hydro will operate their low pressure blowers to increase dissolved oxygen levels. D/R Hydro estimates the cost of running the blowers to be \$200 per day. The projected economic impacts to hydropower production associated with implementing the Proposed Action are an additional 12 days of blower operation per year at a total cost of \$2,400.

#### **4.10 Land Use**

The land surrounding Youghiogheny River Lake is of rural, mountainous character and is sparsely populated compared to other areas in the surrounding counties. Land use is primarily agricultural, which occurs on gently rolling ridges and uplands and is extensively divided by numerous steep forested hillsides and ravines. Although the surrounding land uses are primarily agricultural, several small subdivisions have developed within the past few years. The pace of residential development in the past has been quite slow, and overall land use within the Youghiogheny River corridor should not change drastically in the next decade (USACE, 1999a). However, because of the increases in recreational visitors to this region from outside the established market area, and the increasing development surrounding Deep Creek Lake (10 to 15 miles south of the Youghiogheny River Lake), there is potential for an increased pace of development in the vicinity of the project (USACE, 1999a).

Numerous existing summer home developments occur adjacent to the Youghiogheny River Lake project. The actual buildings are located on private property, however, related structures and landscape maintenance have in some instances encroached on government land. Some of these activities have been granted permits under guidance set forth in the Shoreline Management Plan. Those encroachments not currently permitted will be resolved on a case-by-case basis. Private boat docks are located on the lake and are issued permits by the Corps. At present, 609 private and community docks are under permit.

Problems associated with the summer home developments are numerous (e.g., access, utilities, septic/sewage, etc). There continues to be strong demand for additional docking facilities and increased boating use of the lake. The numerous docks scattered throughout the reservoir visually detract from the naturalistic landscape. The cleared, manicured, and maintained lawns that extend, in some instances, all the way to the shoreline of the lake visually detract from the scenery and appear incongruous with the rugged natural resource setting of the reservoir.

Significant recreation and wildlife acreage occurs in surrounding counties with some timber harvesting locally (USACE, 1999a). Although gas fields and strip mining for limestone, sandstone, sand and gravel, clay, and shale occur in surrounding counties, no mining activities presently occur adjacent to Youghiogheny River Lake. Coalfields generally have been depleted in the region.

#### **4.10.1 Land Use Impacts**

The Proposed Action would not introduce any variation in the reservoir pool elevations that exceeds the current magnitude of fluctuation, and the changes in water level downriver would be indistinguishable from current conditions. There are no significant impacts to the land use near the Youghiogheny River Lake or the downstream river associated with implementation of the Proposed Action.

### **4.11 Recreation**

#### **4.11.1 Youghiogheny River Lake**

Youghiogheny River Lake has facilities available to the public for camping, picnicking, fishing, boating and swimming. Because of the project's location in southwest Pennsylvania and northwest Maryland, the reservoir and associated facilities attract approximately three million visitor hours annually (USACE, 1999a).

According to a recent PAF&BC survey, during the period from March 18, 1998 to October 27, 1998, boat anglers on the reservoir provided 84% of the estimated angling effort (62,346 hours) and shore anglers 16% (PAF&BC, 1999). Total combined angling for the survey period was 74,330 hours or an estimated 26.2 hours/acre. The months of May, June, and July were the highest angling effort months (in that order). An estimated 67% of angling trips were made by boat anglers (12,973) and 33% by shore anglers (6,372 trips) (PAF&BC, 1999). The 1998 walleye catch and harvest rates for the Youghiogheny River Lake (0.0476/angler hour and 0.0103/angler hour respectively) ranked the reservoir as number one and two among the 20 waters surveyed in the Commonwealth (PAF&BC, 1999).

During the normal seasonal drawdown from summer pool to winter pool, several recreation facilities (e.g., Mill Run Swimming Beach, Tub Run Swimming Beach, Mill Run Boat Launch, Jockey Hollow Launch, and various Private Docks) are rendered unusable when pool drawdown reaches certain levels.

#### **4.11.2 Youghiogheny River**

The recreational aspects of the Youghiogheny Lake Dam include the Youghiogheny Lake, the Youghiogheny River above the lake and the 27-mile stretch of the Youghiogheny River downstream of the lake, including both the section known as the “middle Yough” and the 7-mile “lower Yough” (Ohiopyle to Stewarton). These sections are extremely important recreational resources, which are dependent upon, and very sensitive to, the operation of the Youghiogheny Lake Dam. The reaches are runnable with kayaks and rafts when the Confluence gage reads above 1.9 feet for Confluence to Ohiopyle reach and above 1.8 feet for the Ohiopyle to Stewarton reach (USACE, 1992).

The Youghiogheny River downstream of the Youghiogheny Lake is a prime recreational resource. The segment flowing from the dam for 27 miles below the Youghiogheny Lake was found to be qualified for inclusion in the national wild and scenic rivers system for designation as a “scenic river.” A Department of the Interior study under the Wild and Scenic Rivers Act found that the river “can only be described in superlatives—even the casual observer is

impressed with the outstandingly remarkable qualities of the river's scenery and its whitewater" (USDOI, 1978).

The whitewater of the Youghiogheny offers intermediate (Class I to IV) whitewater recreation to a large number of people. From Confluence to Ohiopyle, the river flows through an immense canyon. The rapids in this section are heavily used by canoeists. At Ohiopyle, the navigability of the river is interrupted by Ohiopyle Falls, an enormous 300-yard long rapids and falls complex. Below the falls, the boater or rafter enters a well-known 7-mile segment between Ohiopyle and Stewarton that contains more rapids.

The Youghiogheny River contains whitewater of a character that typically does not exist on other rivers in the same region during the summer season. It is one of very few whitewater rivers available with any degree of reliability to the whitewater enthusiast in the entire Mid-Atlantic region of the United States during the summer. Even during August, Class III plus whitewater is reliably available during most years at the Youghiogheny River.

According to the *Canoeing Guide to Western Pennsylvania and Northern West Virginia*, published by the Pittsburgh Council of the American Youth Hostels, the 11-mile reach from Confluence, PA to Ohiopyle, PA is favorable for canoeists when the Confluence gage reads between 1.9 and 3.5 feet (USACE, 1981). In addition, the 7-mile reach from Ohiopyle to Stewarton is favorable for rafters and advanced canoeists when the Confluence gage height reads between 1.8 and 2.5 feet. Flows of approximately 550 cfs and 700 cfs at the Confluence staff gage are equivalent to a height of 1.85 and 2.05 feet respectively. At present, the Confluence gage reads below 1.9 feet 5 % of the time and below 1.8 feet 2% of the time during the canoeing season (USACE, 1981).

Assuming an April through October season, during the period from 1948 to 1978, the Confluence to Ohiopyle and Ohiopyle-Stewarton reaches were favorable 76 and 52 % of the time, respectively (USACE, 1981).

#### **4.11.3 Recreation Impacts**

The release schedule for the Proposed Action holds the summer pool longer into the late summer and early fall months, as described above. The timing of this operational change would extend the Youghiogheny River Lake boating season by providing water to boat ramps, marina docks, and private docks that are currently unusable (dry) during portions of the main boating season (May – October). The main boating season extension estimates presented in Table 4 are based on the assumption that, in general, weather conditions end the main boating season at the beginning of November. The boating use estimates presented below are also based on the assumption that boating during the winter and spring boating season would not be affected by the Proposed Action's release schedule.

**Table 4. Proposed Action Lake Boating Season Extensions**

Facility	Minimum Usable Pool Elevation	Existing End of Facility Availability	Proposed End of Facility Availability	Facility Availability Extension
Spillway	1391	November	November	No Change
Somerfield N.	1397	End October	November	1 week
Somerfield S.*	1399	Mid October	November	2 weeks
Jockey Hollow	1420	Mid September	Early October	3 weeks
Mill Run	1430	Mid August	End August	2 weeks
Private Docks	1415	End September	Mid October	3 weeks
*Marina				
Source: Pittsburgh District, Operations and Readiness Division				

The additional availability of boating facilities is dependent upon pool elevations that will change from year to year due to annual rainfall and runoff conditions. The projections presented in Table 4 are based on average year pool elevations. The projected extension of the recreational season at the Youghiogheny River Lake is viewed as a positive, albeit minor, impact.

## 4.12 Cultural Resources

The Middle Youghiogheny River corridor and the surrounding areas have been extensively occupied over a time span of some 10,000 years. This area represented a major passageway for individuals moving between the Ohio Valley and the Potomac Valley. The Delaware, Shawnee, and Iroquois Indian tribes were known to have used the Youghiogheny River Basin as hunting and fishing grounds.

Built on the original National Road in 1818, the Great Crossings Bridge is usually inundated by the Youghiogheny River Lake pool. When the pool is drawn down sufficiently to reveal the triple-arch stone bridge, it can be seen on the north side of the existing Route 40 Bridge. Named after the nearby Great Crossings Ford where George Washington crossed the Youghiogheny River in 1754, the Great Crossings Bridge has been inventoried in the state survey of National Road Properties (1987) and the Fayette County Historic Resource Survey (1982) as eligible for the National Register of Historic Places (USACE, 1999a).

There are at least 34 identified archeological sites at the Youghiogheny River Lake. Most of these sites have been characterized as being below normal lake pool elevations. Presently none of the archeological sites identified at the lake have been determined to be eligible for listing on the National Register of Historic Places (USACE, 1999a).

### 4.12.1 Cultural Resources Impacts

The proposed reallocation of water resources does not change the operational impacts of the Youghiogheny River Lake upon the reservoir shorelines, dam structure, and associated structures, or the downstream Youghiogheny River and tributary shorelines. Therefore, the project is not considered an undertaking under Section 106 of the National Historic Preservation Act, as amended.

### **4.13 Environmental Justice**

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Population and Low-Income Populations* (Executive Order, 1994), directs federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority population and low-income populations. When conducting NEPA evaluations, the Corps incorporates environmental justice considerations into both the technical analyses and the public involvement in accordance with EPA and Council on Environmental Quality guidance (CEQ, 1997).

The CEQ guidance defines “minority” as individual(s) who are members of the following population groups: American Indian or Alaskan native, Asian or Pacific Islander, Black, not of Hispanic origin, and Hispanic (CEQ, 1997). The Council defines these groups as minority populations when either the minority population of the affected area exceeds 50 % or the percentage of minority population in the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis.

Low-income populations are identified using statistical poverty thresholds from the Bureau of the Census Current Population Reports, Series P-60 on Income and Poverty (USBC, 2000). In identifying low income populations, a community may be considered either as a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect. The threshold for the 2000 census was an income of \$17,761 for a family of four (USBC, 2000). This threshold is a weighted average based on family size and ages of the family members.

Because of the nature of the Proposed Action, the area of influence for potential Environmental Justice effects is limited to the Youghiogheny River Lake area and, to a lesser extent, downstream communities. According to the most recent census for which county data are available: Fayette County, PA; Somerset County, PA; and Westmoreland County, PA have a 4.7%, 2.6%, and 3.4% minority populations respectively (U.S. Bureau of the Census, 2000a). Minority population for Preston County, WV is 1.2% and Garrett County, MD is 1.2 %.

The most recently published census data indicate that Fayette, Somerset, and Westmoreland Counties have estimates for all people in poverty of 19.1 %, 13.7 %, and 10.2 % respectively (U.S. Bureau of the Census, 2000a). Garrett County, MD and Preston County, WV have estimated poverty levels of 15.8 % and 17.8 %, respectively.

#### **4.13.1 Environmental Justice Impacts**

A proposal must have potential for disproportionately high and adverse human health or environmental effects on low-income populations, minority populations, and Indian tribes in order to have Environmental Justice impacts. Implementing the Proposed Action would not result in any change to environmental resources that individuals involved in subsistence fishing or hunting utilize, would not involve the release of hazardous, toxic, or radioactive materials to which minority or low-income populations could be exposed, and there would be no construction of any new water treatment facilities, and no relocation of any roads, utilities, businesses, or

residences required. As such, the very nature of the Proposed Action precludes the potential to create disproportionately high and adverse human health or environmental effects on low-income populations, minority populations, or Indian tribes.

#### **4.14 Transportation and Infrastructure**

The current highway system provides adequate access to the project area. Interstates 70 and 76, significant east-west transportation routes are located to the north of the project area. Interstate 79 is an important regional transportation link from the Pittsburgh metropolitan area and Great Lakes region to the southern Appalachian region. To the south is the recently constructed Interstate 68, which passes just south of Friendsville at the southern end of the project. Interstates 70, 76, and 79 provide access to regional population centers. Interstate 68 provides access to some of the areas to the south and east of the project. Because of the proximity of the project to the Baltimore/Washington, D.C. metropolitan area and with the completion of the new interstate, the number of visitors from these metropolitan areas is increasing (USACE, 1999a).

##### **4.14.1 Transportation and Infrastructure Impacts**

The Proposed Action will not involve any physical changes to the transportation infrastructure and will not include actions that create temporary or permanent changes to the existing road use. There are no impacts to the transportation infrastructure or regional traffic patterns associated with this Proposed Action.

#### **4.15 Aesthetics**

##### **4.15.1 Youghiogheny River Lake**

Visitor surveys have revealed that the visual quality of the Youghiogheny River Lake is a very important resource and one of the reasons they use the lake for recreation (USACE, 1999a). The scenic resources of Youghiogheny River Lake are directly related to the wooded slopes adjacent to the lake and stream environments. The most significant visual attractions are the lake surrounded by densely forested hills, the Youghiogheny River, and the numerous streams flowing through forested ravines. Other scenic features include rock outcroppings and seasonal color changes and floral displays of natural vegetation. Vistas of the lake occur at various locations including the dam, various recreation areas, the U.S. 40 Bridge, and certain locations on public roads surrounding the project. Other areas within the project provide views of a smaller scale such as along the smaller streams flowing into the lake. Existing observation areas include a small parking area near the control tower and a parking area at the west end of the dam.

Youghiogheny River Lake has excellent scenic qualities, especially when the lake is near the summer pool. However, during periods of extreme draw down, typically in August and September, the visual qualities are diminished due to the appearance of mud flats along the shoreline. The most extensive mud flats occur in the Maryland portion of the reservoir and in certain bays, such as Tub Run, Jockey Hollow, and Buffalo Run.

#### **4.15.2 Youghiogheny River**

Downstream of the dam, the Youghiogheny River flows through a sloping canyon covered with vegetation and trees typical of the eastern forest. The lush vegetation on the steep slopes, combined with the swiftly flowing water, creates a setting of impressive grandeur (USDOI, 1978). The scenery of the Youghiogheny River below Ohiopyle is given the highest rating in comparison to other whitewater streams in the region, including the mountain rivers of West Virginia; a whitewater guide that includes the Youghiogheny notes that “the scenery is spectacular—what you have time to see.” (Burrell and Davidson, 1972). As quoted from Jackson’s *Whitewater, Running the Wild Rivers of North America*, “For the experienced whitewater boater, this broad, beautifully scenic river has it all, and has it longer than any other river in the area.”

#### **4.15.3 Aesthetics Impacts**

The Proposed Action would not introduce any variation in the reservoir pool elevations that exceeds the current magnitude of fluctuation. Holding the summer pool longer into the year would improve the aesthetics associated with the recreational use of the Youghiogheny River Lake. Changes in water level downriver because of implementing the Proposed Action would be indistinguishable from current conditions. There would be no significant impacts to the aesthetics near the Youghiogheny River Lake or the downstream river associated with implementation of the Proposed Action.

### **4.16 Hazardous, Toxic, and Radioactive Waste Contaminants**

The Proposed Action does not involve the use or release of hazardous, toxic, or radioactive substances. There are no known areas of HTRW contamination downriver or in areas affected by current reservoir operation.

#### **4.16.1 Hazardous, Toxic, and Radioactive Waste Contaminants Impacts**

There will be no HTRW impacts associated with implementing the Proposed Action.

### **4.16 Cumulative Effects**

This Environmental Assessment provides an impact analysis up to the 10,000 acre-foot limit. If additional storage reallocation to water supply were requested from the Corps of Engineers, additional hydrologic and environmental analyses would be required to determine if additional storage beyond the 10,000 acre-feet could be re-allocated.

As stated previously in Section 1.2, a Corps document entitled “Water Supply Potential of Youghiogheny River Lake” (1981) examined the capability of the Youghiogheny River Lake to provide water supply.

Section 70 of the 1981 report examined the effects of revising the existing release schedules and concluded that “Significant excesses [of water storage] occurred ...[and]... the result, without any structural modification [to the dam] was a computed excess storage of 15,700 and 29,300 acre-feet respectively.” The study asserted that there were “significant excesses” of storage in the Youghiogheny River Lake that could be reallocated for water supply leaving no detrimental effects even during the most severe droughts.

The excess storage calculations of 15,700 and 29,300 acre-feet should not be taken at face value or as a reliable quantification of the total water that could be available for re-allocation. These estimates were developed over 20 years ago and were based on the limitations of the modeling tools and knowledge of the down stream water quality at that time. However, they do represent a measure of confidence that the 10,000 acre-feet proposed for the reallocation in the current proposal is significantly less than the numbers previously determined.

#### **4.17 Actions to Mitigate the Effects of the Proposed Action**

Environmental impacts predicted as a consequence of implementing the Proposed Action are minimal and insignificant. As such, there are no formal commitments to mitigation necessary to establish a finding of no significant impact.



## **5 CONCLUSIONS**

Several critical factors must be considered in quantifying the potential environmental significance of implementing the Proposed Action. Specifically, these are:

1. Permit authority to withdraw the water from the Youghiogheny River is strictly the responsibility of the Commonwealth of Pennsylvania administered through PADEP. The Corps can only authorize the sale of storage in the reservoir and establish an approved release schedule.
2. If the Corps completes the Proposed Action, the Sponsor would not need a permit modification from the PADEP to withdraw the water. Provided the increased flow maintains the current  $Q_{7-10}$  flow at Connellsville, the Sponsor's current PADEP permit includes the additional capacity.
3. There will be no structural changes to the Youghiogheny River Dam or the Sponsor's water intake/treatment facilities as a part of the Proposed Action. The water will be withdrawn from the river from the existing water intakes and processed through the Sponsor's existing facility in South Connellsville.
4. There will be no construction, excavation, or ground-disturbing activities associated with any part of the Proposed Action.
5. The proposed reallocation of storage is not a guarantee of yield from the Youghiogheny River Lake. Under certain hydrologic conditions (i.e., extreme drought), the water purveyors may not be allowed to utilize their full allocation. The conditions wherein the water purveyors would not have any yield would be addressed in the water supply agreement with the Corps.
6. This proposal will have no effect on the flood protection capability of the Youghiogheny River Lake.
7. The proposed reallocation of storage and revision to the release schedule would only affect frequency and duration of inundation in areas already subject to inundation (including both the Youghiogheny River Lake and the downstream river) by the current Youghiogheny River Lake operations.

Based on the nature of the Proposed Action, there are no potential for environmental impacts, from changes to: infrastructure; transportation; meteorology and climatologic factors; demographics; land use; air quality; noise; pesticide use; drinking water regulations/sole-source aquifers; environmental justice; solid, hazardous, toxic, and radioactive waste; and cultural/historic resources.

The impact assessment addressing water quantity in the lake (pool elevation) and in the river (flow), water quality (dissolved oxygen levels and water temperature) in the lake and river, aquatic and terrestrial ecology, recreation, and aesthetics indicate that no significant environmental impacts are expected.

## **6     FIGURES**

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Figure 1. Location of the Youghiogheny River Lake

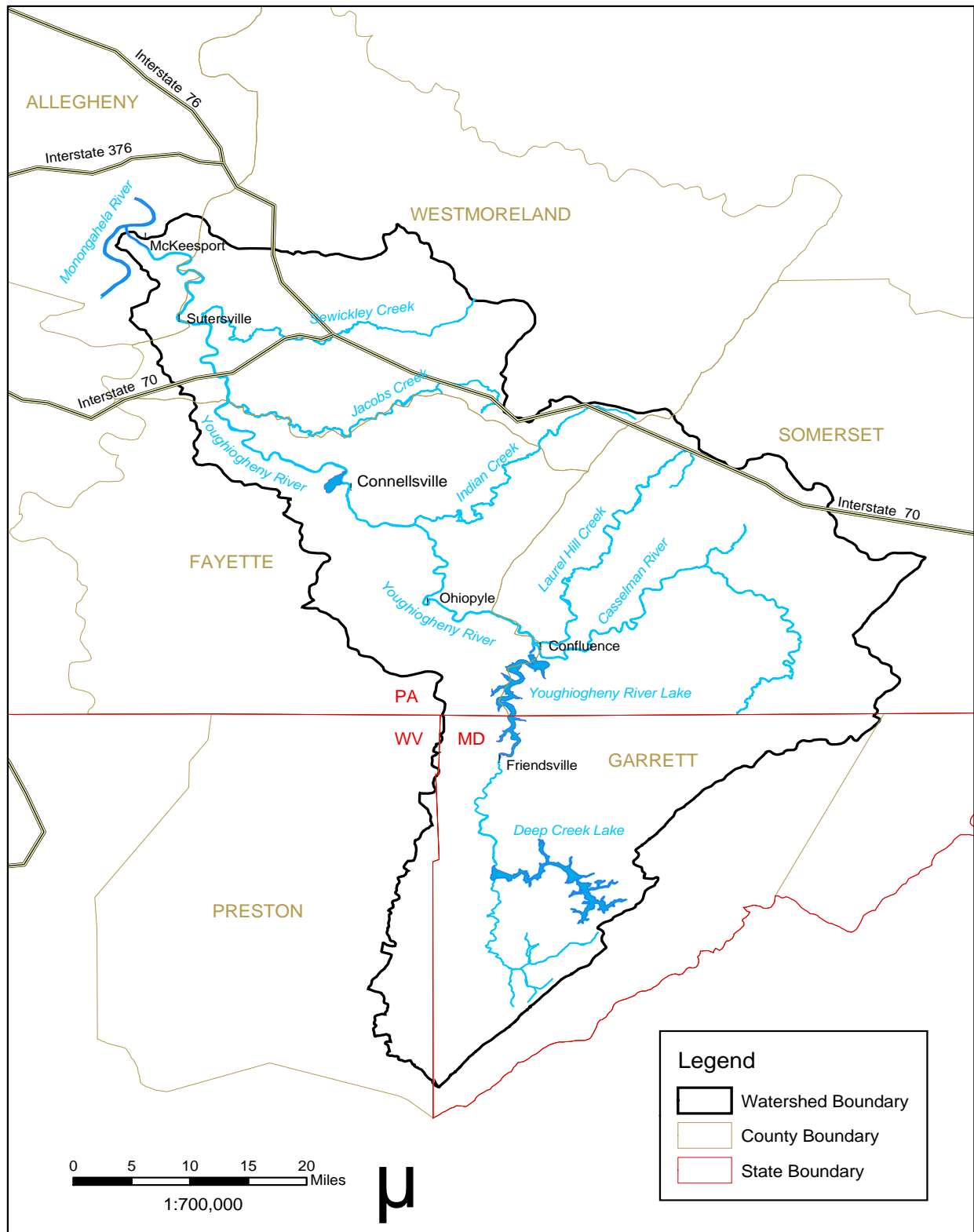


Figure 2. Current Youghiogheny River Lake Drawdown

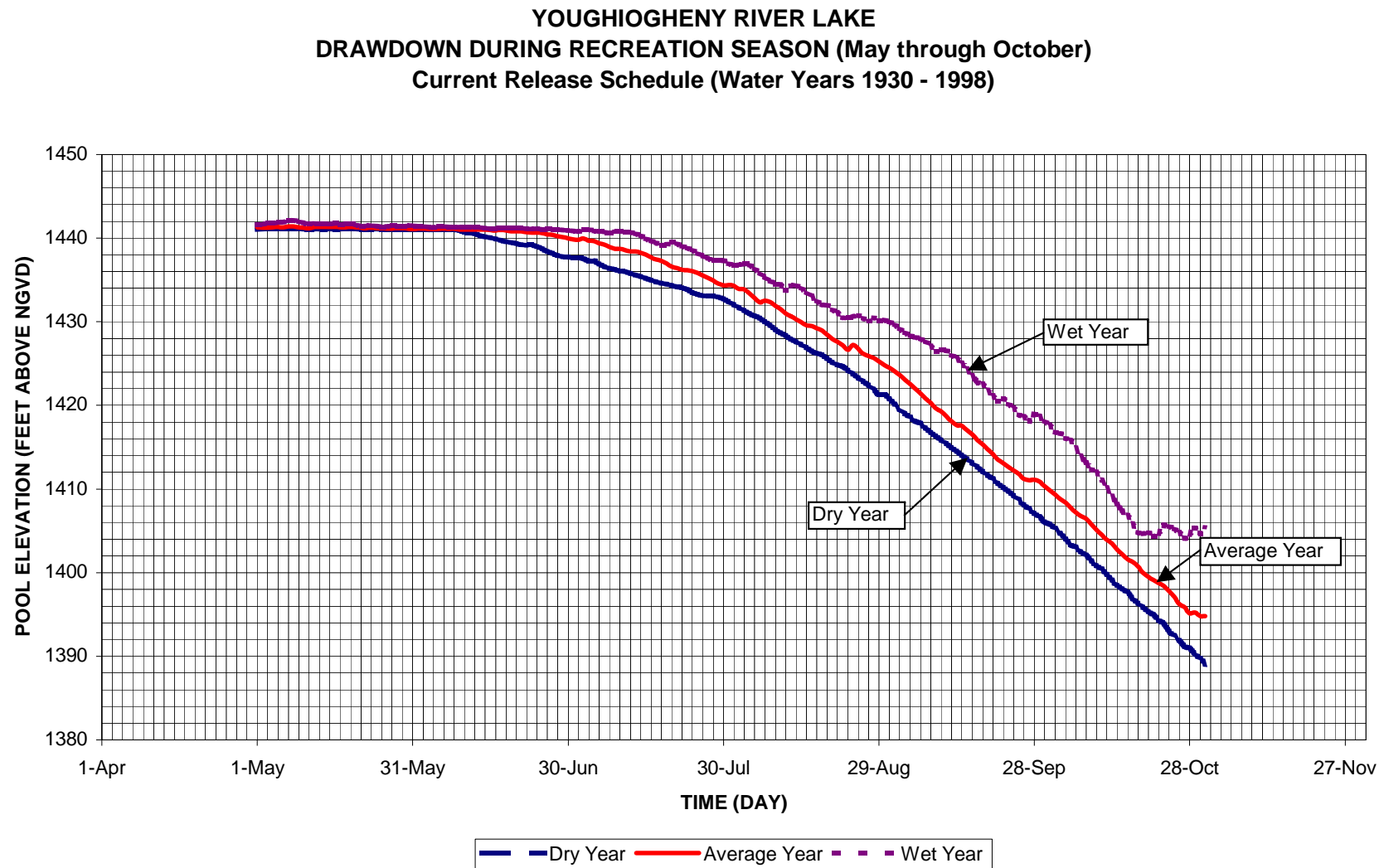


Figure 3. Proposed Action Youghiogheny River Lake Drawdown

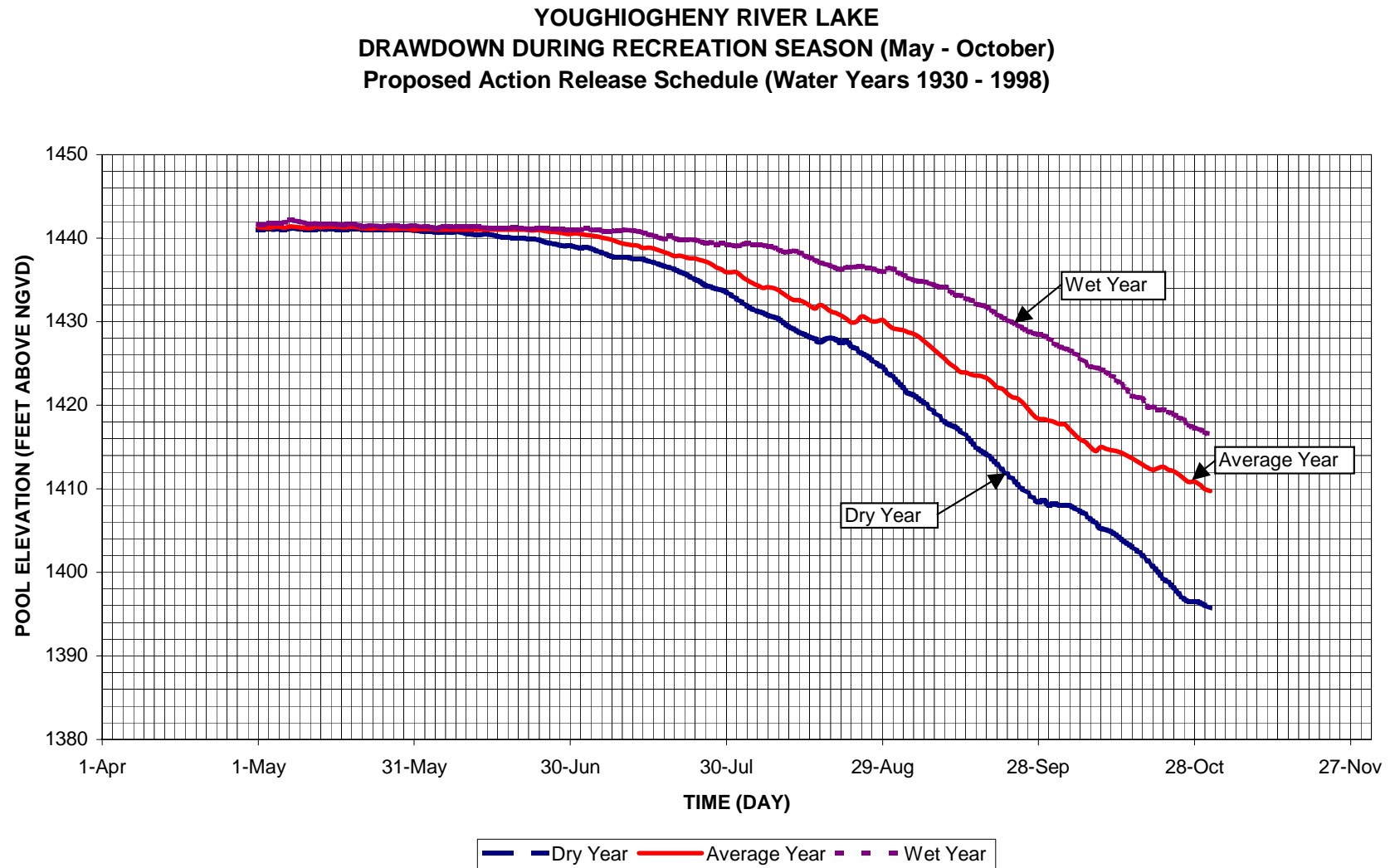


Figure 4. Modeled  $Q_{710}$  Low Flow Frequency at Connellsville, PA

YOUGHIOGHENY RIVER LAKE WATER MANAGEMENT  
AND REALLOCATION FEASIBILITY STUDY  
CONTINUOUS 7-DAY LOW ANNUAL FLOW FREQUENCY

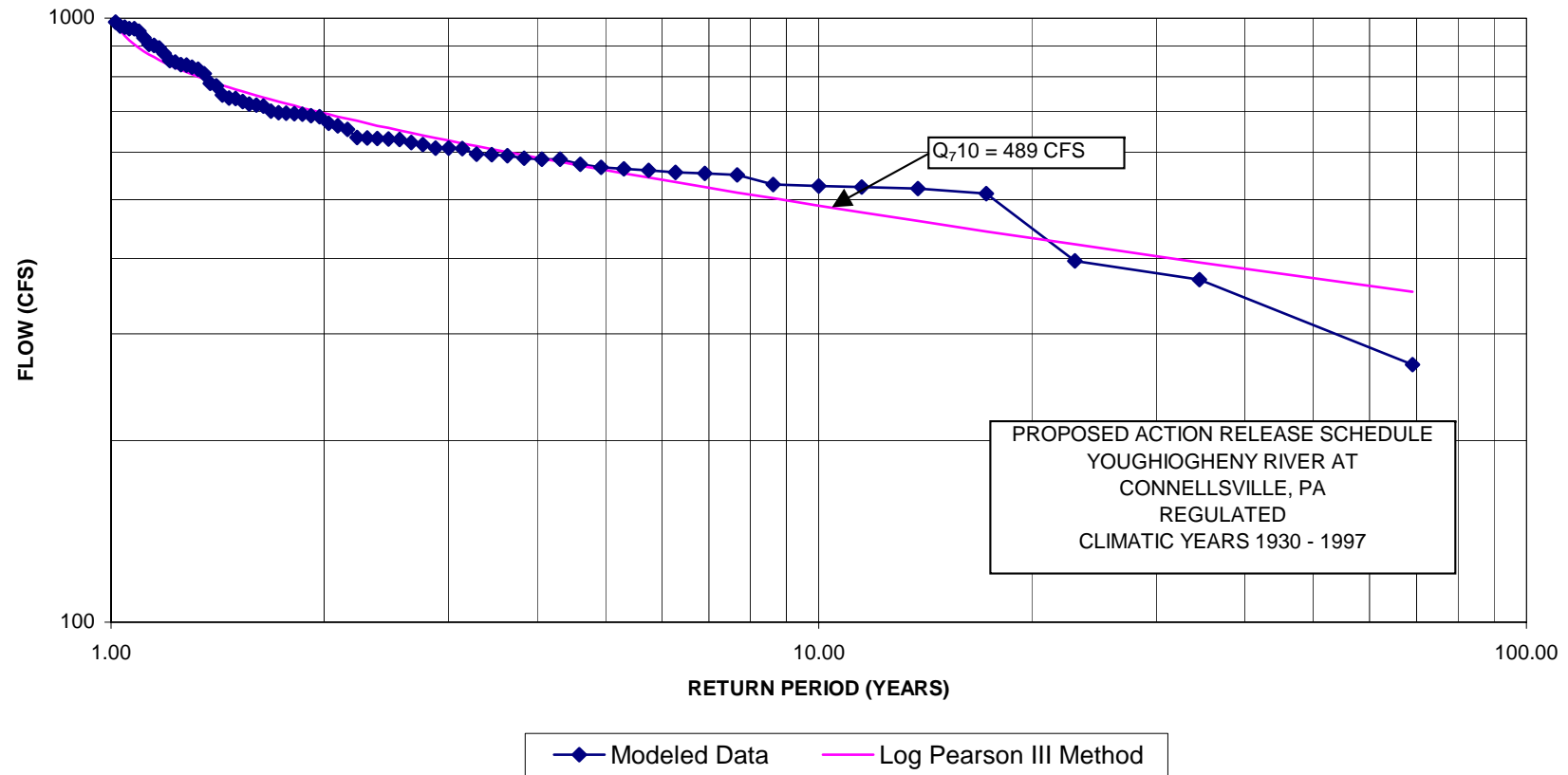


Figure 5. Youghiogheny River Stage Duration Curves at Confluence, PA

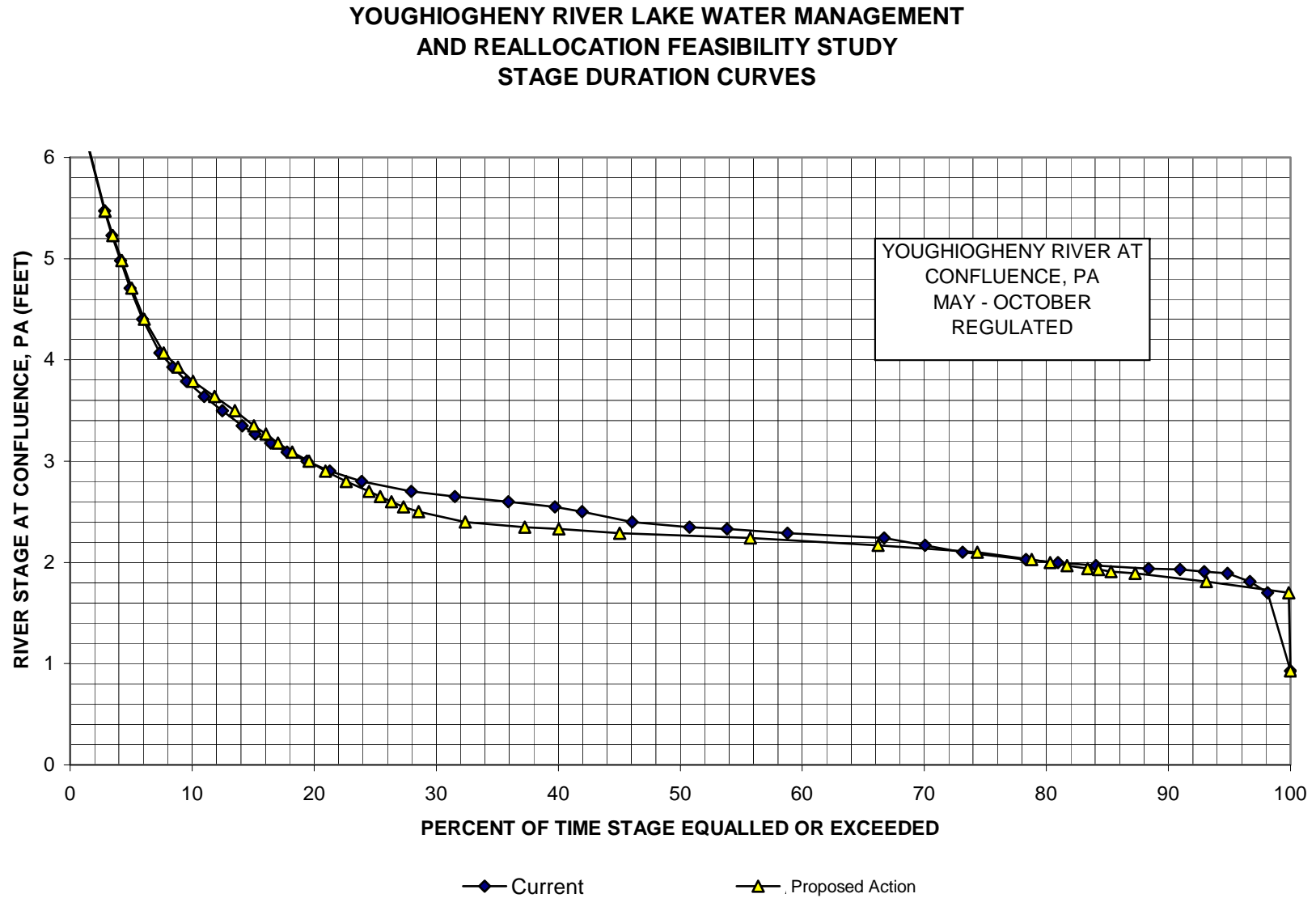
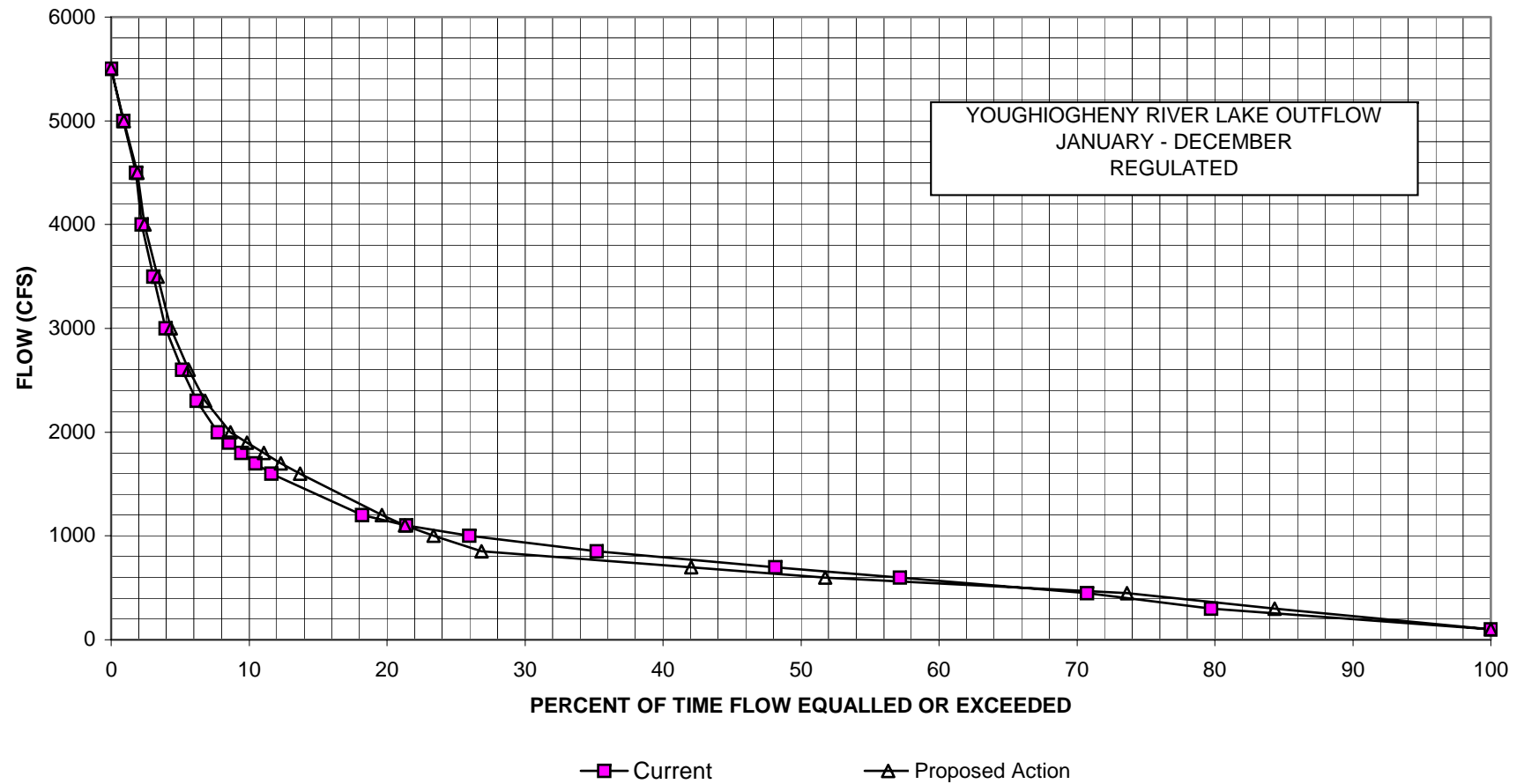




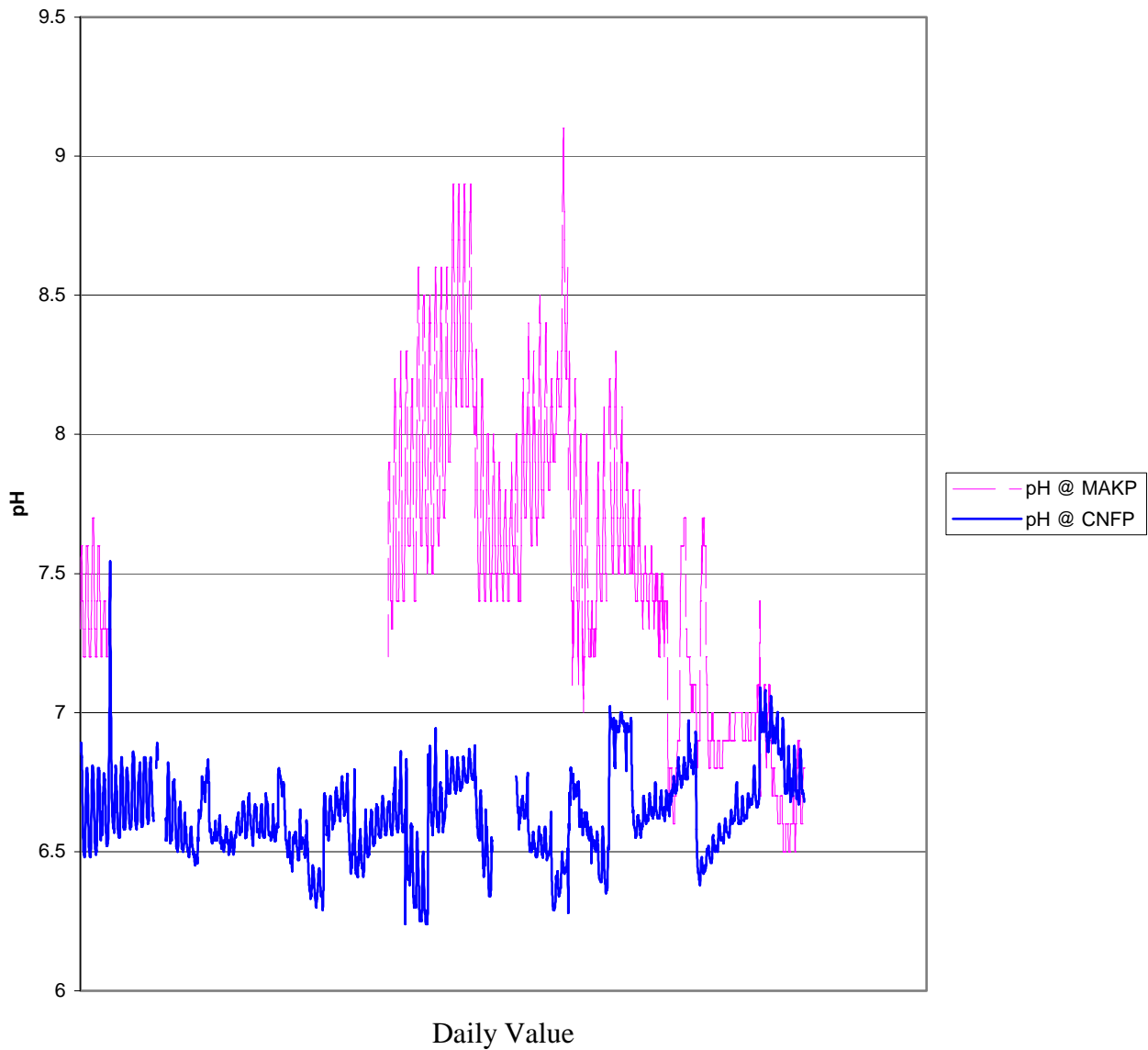
Figure 6. Youghiogheny River Flow Duration at Confluence, PA

YOUGHIOGHENY RIVER LAKE WATER MANAGEMENT  
AND REALLOCATION FEASIBILITY STUDY  
FLOW DURATION CURVES



**Figure 7. 1998 pH Data on the Casselman and Youghiogheny Rivers**

**pH on Casselman River (MAKP) and Youghiogheny River (CNFP)  
Downstream  
May 28 to September 30, 1998**



## **7 LIST OF AGENCIES AND PERSONS CONSULTED**

Bonnie Crosby, U.S. Department of the Interior Fish and Wildlife Service  
Andrew Shiels, Pennsylvania Fish and Boat Commission  
Jeanne Harris, Pennsylvania Department of Conservation and Natural Resources  
Gary Camus, Pennsylvania Game Commission  
Ray Dintaman, Maryland Department of Natural Resources  
Gary Setzer - Maryland Department of the Environment

## **8 LETTERS OF CONSULTATION**

### U.S. Department of the Interior, Fish & Wildlife Service

From: Bonnie\_Crosby@fws.gov [mailto:Bonnie\_Crosby@fws.gov]  
Sent: Friday, July 06, 2001 1:42 PM  
To: Moskovitz, Larry R LRP  
Subject: Re: Youghiogheny Dam Reallocation Study - Preliminary Section 7 Coordination

To: Larry Moskovitz

From: Bonnie Crosby  
Endangered Species Biologist  
U.S. Fish and Wildlife Service  
315 South Allen Street  
State College, PA 16801

RE: Youghiogheny River Lake Reallocation Study

I have conducted a threatened and endangered species review for the Youghiogheny River Lake Reallocation Study. These comments relate only to the Pennsylvania portion of the study area. This area includes portions of Somerset and Fayette Counties.

Except for occasional transient species, no federally listed or proposed threatened or endangered species under our jurisdiction are known to occur within the project impact area. Therefore, no biological assessment nor further Section 7 consultation under the Endangered Species Act are required with the Fish and Wildlife Service. This determination is valid for two years from the date of this letter. If the proposed project has not been fully implemented prior to this, an additional review by this office will be necessary.

If you have any questions, feel free to contact me at 814-234-4090 x234.

Maryland Department of Natural Resources (DNR)

-----Original Message-----

From: GGOLDEN@dnr.state.md.us [<mailto:GGOLDEN@dnr.state.md.us>]

Sent: Wednesday, August 22, 2001 5:15 PM

To: Moskovitz, Larry R

Subject: RE: MD - DNR comments on Youghiogheny River Lake - Preliminary  
Coordination

Larry:

Thank you for the recent email (copied below) and the information provided within. I ran this information by our rare species specialist. The time frames and the areas within the lake and river to be influenced were considered. We have concluded that these characteristics are acceptable, and will not result in negative impacts to the hellbenders in the river, or other important wildlife habitat in the area. To summarize, we have no additional comments, and no objections or concerns on the proposed management schedules and the resulting minor changes to lake characteristics/levels. Please let me know if you have additional questions or information requiring coordination and review.

Greg Golden  
Environmental Review Unit  
Maryland Department of Natural Resources  
410-260-8334

## Pennsylvania Game Commission

-----Original Message-----

**From:** Camus, Gary [mailto:gcamus@state.pa.us]

**Sent:** Thursday, July 05, 2001 7:09 AM

**To:** 'Moskovitz, Larry R LRP'

**Subject:** RE: Youghiogheny River Lake Reallocation - Preliminary Coordination

Larry;

I read the E-mail information you provided for the proposed changes to the water release schedule from the Youghiogheny River Lake and I don't believe any impacts will occur as long as downstream high water elevations are not exceeded and maximum pool elevations for the existing lake are not increased substantially. Please keep me in the loop on any concerns from other environmental agency reviews.

-----Original Message-----

**From:** Moskovitz, Larry R LRP [mailto:Larry.R.Moskovitz@lrp02.usace.army.mil]

**Sent:** Friday, June 29, 2001 2:03 PM

**To:** 'gcamus@pgc.state.pa'

**Subject:** Youghiogheny River Lake Reallocation - Preliminary Coordination

Gary: Your secretary gave me your e-mail address. This e-mail involves our preliminary coordination with the game commission in regards to proposed changes to the release schedule of our Youghiogheny River Lake. Please review the attached files and let us know by e-mail if you think the project would have any impact on any state listed endangered or threatened species or species of concern. Please call me Monday July 2 if you have any questions on this matter. I have coordinated this same information with the Fish and Boat Commission, the PADCNr and the U.S Fish and Wildlife Service.

Thanks so much!

Larry Moskovitz

Planning Branch

412-395-7205

## 9 REFERENCES

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## **List of Acronyms and Conversions**

Acre-foot – measure of water volume where 1 acre-foot = 325,853 gallons  
AMD – Acid Mine Drainage  
cfs – cubic foot per second (measure of water volume flowing per unit time)  
CEQ – President’s Council on Environmental Quality  
DO – Dissolved Oxygen  
DCP – Drought Contingency Plan  
EA – Environmental Assessment  
EPA – Environmental Protection Agency  
FERC – Federal Energy Regulatory Commission  
FONSI – Finding of No Significant Impact  
Hectare – 1 hectare = 2.5 acres  
HTRW – Hazardous, Toxic, and Radioactive Waste  
MAWC – Municipal Authority of Westmoreland County  
msl – mean sea level, measured in feet above msl (e.g., 1400 feet)  
MGD – million gallons per day  
mg/l – milligrams per liter (1 mg/l = 1 part per million)  
NEPA – National Environmental Policy Act  
NGVD - National Geodetic Vertical Datum  
PADEP – Pennsylvania Department of Environmental Protection  
PADER – Pennsylvania Department of Environmental Resources (now PADEP)  
PAF&BC – Pennsylvania Fish & Boat Commission  
pH – measure of the acidity/alkalinity of water (0-14, 7.5 = neutral)  
Q<sub>7-10</sub> - the one in 10-year, seven-day, low flow in a river  
USACE – U.S. Army Corps of Engineers  
USF&WLS – U.S. Fish and Wildlife Service  
WRDA – Water Resources Development Act

Production Team Personnel, David Miller & Associates: Contractor for Pittsburgh District  
Michael McGarry , Jerry Diamantides, Rob Wiley,  
Quality Control: David Miller

Production Team Personnel, Pittsburgh District: Jim Cinciosi CELRP-PM-PF, Bob John  
CELRP-OR-TR, Werner Loehlein CELRP-EC-WW, Mark Philips CELRP-EC-WW, Carmen  
Rozzi CELRP-PM-MM, Bob Waigand CELRP OR-E, Rose Reilly CELRP-EC-WW, Larry  
Moskovitz CELRP-PM-PF, Neill Purcell CELRP-OC.  
Quality Assurance Review: Ed Smith CELRP-PM-PF, Laurence Homich CELRP-OR-TR, Jim  
Kosky CELRP-EC-WH

District Production Personnel no longer employed at the District: Mike Koryak, Jim Purdy,  
Maria Novak

Production Team Personnel, Municipal Authority of Westmoreland County: Curt Fontaine, Tom  
Peto, George Sweeney, Chris Kerr

## **10 FONSI**

### **Finding of No Significant Impact**

#### **Youghiogheny River Lake Water Management and Reallocation**

The Pittsburgh District is proposing to reallocate 10,000 acre-feet of storage within the Youghiogheny River Lake from water quality to water supply and to revise the release schedule. Water quality improvements downstream of the Youghiogheny River Lake have diminished the need for water quality releases and allowed the proposed changes with no negative impacts to the downstream water quality. This reallocation of storage and change to the release schedule will allow the District to enter into water supply agreements with interested water purveyors up to the amount of storage reallocated for water supply.

The Proposed Action is projected to have only negligible impacts on water quantity and water quality conditions in the river. The changes to water quantity in the river are very small, and although minor increases in flow are conceptually beneficial to whitewater rafting on the river, the changes are too small to have a measurable economic impact. Similarly, water quality conditions, water temperature and dissolved oxygen levels, would be only slightly affected by the Proposed Action. The minor effects on water quality are not projected to have measurable impacts on the existing cold-water fishery. Given the low level of projected impacts to riverine conditions, there are no measurable economic impacts attributed to changes in riverine conditions associated with the Proposed Action.

The EA discusses various alternatives as well as the no action alternative on pages 4 to 7. Potential impacts were assessed with respect to: hydrology, geology, soils, erosion, meteorology, climate, air quality, water quality, terrestrial and aquatic ecology, protected species and habitat, demographics, socioeconomics, land use, recreation, cultural resources, environmental justice, transportation and infrastructure, aesthetics, and hazardous, toxic, and radioactive contaminants. Copies of the draft report were circulated to Federal and state natural resource agencies as well as interested private citizens. The Federal and state agencies, local organizations and private citizens and who received copies of the draft report will also receive copies of the final report in either hard copy or CD format. In addition, CD's and/or hard copies of the final report will be made available to the following libraries: Carnegie Free Library, Connellsville, PA; Uniontown Public Library, Uniontown, PA; Mary Fuller Community Library, Perryopolis, PA; Brownfield Public Library, Dawson, PA; and the Fayette Campus Library, Penn State University, Uniontown, PA.

Under the National Environmental Policy Act, the District prepared an Environmental Assessment of the Proposed Action. Separate consultations were undertaken with the U.S. Fish and Wildlife Service under the Endangered Species Act. In addition, the District coordinated with the Pennsylvania Department of Conservation and Natural Resources and the Maryland Department of Natural Resources to determine potential impacts to protected species and no impacts are expected from implementing the Proposed Action. Implementation of the proposed

changes to the release schedule would not require the placement of dredged or filled material into waters of the United States. Because of the limited nature of the proposed changes to the release schedule, the project is not considered an undertaking under Section 106 of the National Historic Preservation Act and would have no effect on any cultural resources.

After having carefully evaluated and balanced all beneficial and detrimental aspects relating to implementing the Proposed Action, as described in the Environmental Assessment, I have reasonably concluded that the public interest will be best served by its implementation. Since implementation of the proposed project and the associated activities would not significantly affect the quality of the human environment, the preparation of an environmental impact statement is not warranted. This FONSI precedes the Corps of Engineers final decision on the proposed action.

24 October 2003  
Date

/s/  
Raymond K. Scrocco  
Colonel, Corps of Engineers  
District Engineer